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Industrial Combustion Emissions (ICE) Model Version 6.0. User's Manual

Energy and Environmental Analysis, Inc.
Arlington, VA

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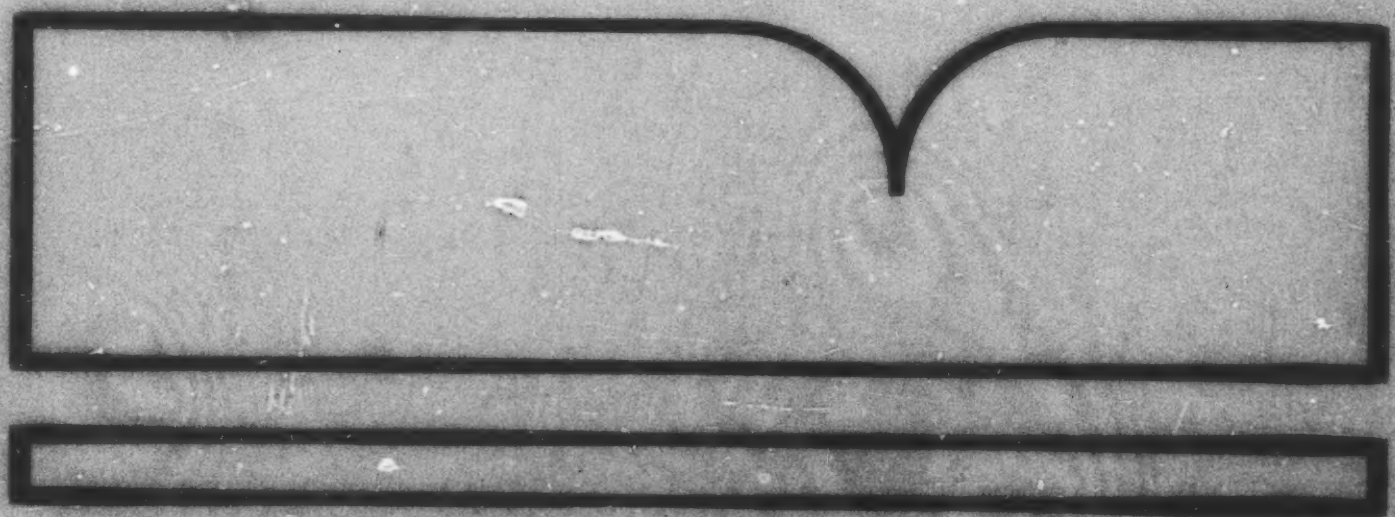

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February 1988

INDUSTRIAL COMBUSTION EMISSIONS MODEL (VERSION 6.0) USER'S MANUAL

By

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16. ABSTRACT The report is a user's manual for the Industrial Combustion Emissions (ICE) model. It summarizes user options and software characteristics, and describes both the input data files and procedures for operating the model. It discusses proper formatting of files and creation of job control language. The model projects for each state the emissions of sulfur oxides, sulfates, and nitrogen oxides from fossil fuel combustion in industrial boilers. Emissions and costs of boiler generation, including emission control costs, are projected for the years 1985, 1990, 1995, 2000, 2010, 2020, and 2030.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS		b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group	
Pollution	Sulfur Oxides	Pollution Control	13B	07B
Fossil Fuels	Sulfates	Stationary Sources	21D	
Combustion	Nitrogen Oxides	Industrial Combustion	21B	
Emission	Cost Estimates	Emissions (ICE) Model	14G	05A, 14A
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ABSTRACT

The Industrial Combustion Emissions (ICE) Model is one of four stationary source emission and control cost forecasting models developed by the Air and Energy Engineering Research Laboratory for the National Acid Precipitation Assessment Program. The ICE Model projects air pollution emissions (sulfur dioxide, sulfates, nitrogen oxides and particulate matter), costs and fuel mix for industrial fossil fuel-fired (natural gas, distillate and residual fuel oil and coal) boilers by State and year (1980 baseline, 1985, 1990, 1995, 2000, 2010, 2020, and 2030).

This document is a user's manual for ICE Model Version 6.0. It includes a summary of user options and software characteristics, a description of the input data files and instructions for operation of the ICE Model in either the TSO or Wilbur environment. Version 6.0 of the ICE Model is maintained on the EPA National Computer Center (NCC) IBM-3090 mainframe computer system at Research Triangle Park, NC. Only the TSO operating environment is supported by the NCC for new users.

The ICE Model is available for remote terminal access and operation at the NCC. A transcription of the ICE Model is also available on magnetic tape. For information on operating the model at the NCC or obtaining a copy on magnetic tape, contact the National Technical Information Service (NTIS). Information can be obtained from Lois Grooms, NTIS, 5285 Port Royal Road, Springfield, Virginia 22161, 703/487-4808, or Larry Jones, USEPA, Air and Energy Engineering Research Laboratory, Mail Drop 62, Research Triangle Park, NC 27711, 919/541-7716.

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SECTION 1
INTRODUCTION

MODEL OVERVIEW

The ICE Model was developed by Energy and Environmental Analysis, Inc. (EEA) for EPA's Air and Energy Engineering Research Laboratory to support EPA's analysis of acid deposition control alternatives. The ICE Model projects industrial fossil fuel-fired boiler:

- Fuel mix (natural gas, distillate and residual fuel oil, and coal)
- Air emissions (sulfur dioxide, sulfates, nitrogen oxides and particulate matter)
- Costs

by State for 1985, 1990, 1995, 2000, 2010, 2020, and 2030.

The ICE Model is a disaggregated process engineering model; models of this type simulate the effects of specific policies on technical alternatives for new and existing equipment. The ICE Model is designed to assess the impact of several factors on industrial boiler fuel choice decisions and air emissions, including local and Federal air emissions regulations, fuel price forecasts, and capital and annual operating and maintenance (O&M) costs of firing alternative fuels or retrofitting pollution control equipment.

The base year in the ICE Model Version 6.0 is 1980. Industrial boilers existing in 1980 are identified by size, annual capacity utilization rate, fuel type, State, industry group, and average air emissions rates. The existing boilers may add or modify pollution control equipment in response to proposed revisions in air emissions regulations. Existing boiler may also retrofit to burn a different fuel type in response to proposed revisions in air emissions regulations or alternative fuel price forecasts. Existing boilers are also retired over time.

Total projected industrial boiler fossil fuel demand is an exogenous model parameter. Total fossil fuel demand in new boilers (installed after 1980) is equal to total projected fossil fuel demand less consumption in existing units

(after retirement). Each new boiler is sited in an Air Quality Control Region (AQCR) according to historical location patterns. The ICE Model applies current State environmental regulations on an AQCR basis because they often vary within a State.

USER OPTIONS

Figure 1 summarizes the major ICE Model user options. "User options" are defined to be frequent user modifications to a subset of the model input files.

The ICE Model user options can be classified in two groups:

- Air emissions regulations; e.g., alternative New Source Performance Standards (NSPS)
- "Energy scenario" specifications

Alternative NSPS refers to alternative Federal air emissions standards for sulfur dioxide (SO_2) and particulate matter (PM) emissions from the combustion of coal and residual fuel oil in new industrial boilers. Energy scenarios specifications are exogenous projections of:

- Industrial fossil fuel prices
- Total industrial boiler fossil fuel demand

Alternative NSPS

There are eight industrial boiler size classes in the ICE Model, MW (MMBtu/hr heat input):

- <9 (<30)
- 9-15 (30-50)
- 15-22 (50-75)
- 22-29 (75-100)
- 29-44 (100-150)
- 44-58 (150-200)
- 58-73 (200-250)
- >73 (>250)

Model users may specify emissions ceilings by boiler size category, annual capacity utilization rate (less than or greater than 30 percent), pollutant and fuel type (SO_2 only for residual fuel oil; SO_2 and PM for coal) in terms of pounds of emissions per million Btu of fuel consumption.

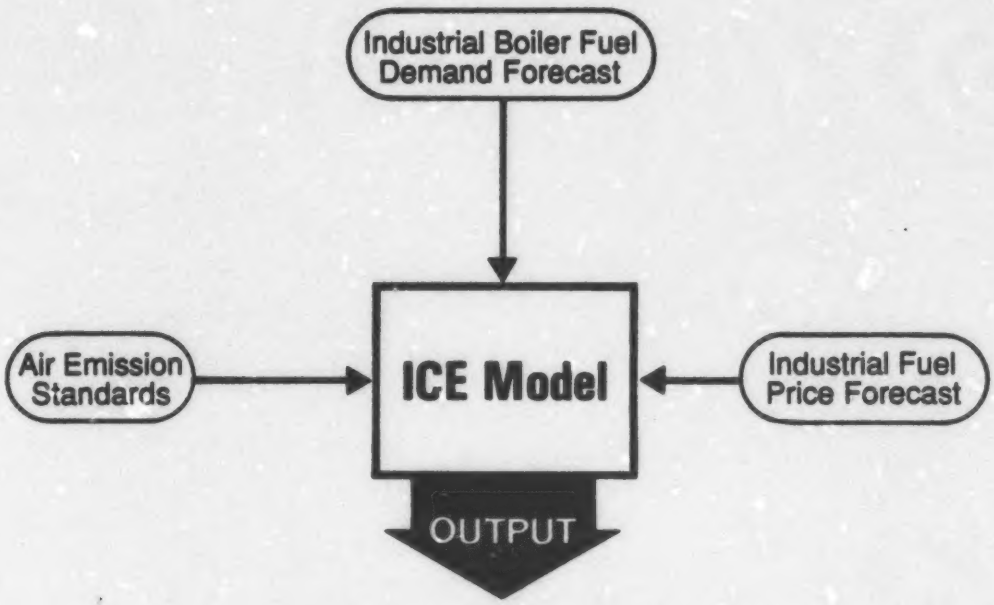

Figure 1. ICE Model user options.

Mandatory scrubbing can also be required for new residual fuel oil and coal boilers by size class. The SO_2 emissions percentage removal requirement can be fixed (constant for all fuel types regardless of sulfur content) or variable (function of the sulfur content of the fuel, such as the current electric utility coal-fired boiler NSPS).

The emissions standards, when expressed as emissions ceilings (lb/MMBtu), limit compliance alternatives. For example, a mechanical collector is assumed not to be able to comply with a very low (e.g., 0.05 lb/MMBtu) coal PM emissions regulation. A very low (e.g., 0.2 lb/MMBtu) coal SO_2 emissions ceiling will restrict coal compliance options to scrubbing low sulfur coals.

NO_x NSPS assumptions are not ICE Model Version 6.0 user options. For new industrial gas/oil boilers larger than 29 MW (100 MMBtu/hr) and installed after 1985 in the ICE Model, low excess air (with controlled NO_x emission rates of 52-86 ng/J, 0.12-0.19 lb/MMBtu) is required to control NO_x emissions.*

The alternative NSPS assumptions apply only to new industrial boilers. They do not apply to existing industrial boilers. However, alternative national SO_2 emission standards for existing industrial residual fuel oil and coal boilers can also be specified. Existing boilers may be subject to revised SO_2 emission regulations related to acid deposition control strategies.

The user may also specify a market penetration rate for fluidized bed combustion. Atmospheric pressure, conventional bubbling bed fluidized bed combustion (FBC) is an optional SO_2 emissions control technology for new coal-fired boilers in the ICE Model. Users may specify a fraction between zero and one that varies by year and represents the expected number of FBC units divided by the number of new coal boilers which require SO_2 emission control equipment. FGD systems are the alternative SO_2 emissions control equipment technology.

Industrial Fossil Fuel Price Forecast

Projected delivered industrial fuel prices are required for the following fuel types:

- Natural gas
- Distillate fuel oil

---

* Exception: staged combustion air is required for 3.0 percent sulfur residual fuel oil in the ICE Model Version 6.0.

- Residual fuel oil
  - 3.0 percent sulfur
  - 1.6 percent sulfur
  - 0.8 percent sulfur
  - 0.3 percent sulfur
- Coal*

Fuel prices are required for every five years (1980-2040) and by Federal region (see Figure 2) in constant 1980 ¢/MMBtu.

Industrial Boiler Fossil Fuel Demand Forecast

Total projected industrial boiler fossil fuel demand is an exogenous parameter. The ICE Model has not been used as a portion of a "general equilibrium" system which simultaneously reflects the interactions between the economy and energy markets. The ICE Model does not address the relationship between overall industrial production and energy demand. The ICE Model is a fuel choice model calibrated to an exogenous forecast of total industrial boiler fossil fuel demand.

"Total industrial boiler fossil fuel demand" is defined to include only the sum of:

- Natural gas
- Distillate and residual fuel oil
- Coal

Projections are required by State, industry group, and year (1985, 1990, 1995, 2000, 2010, 2020, and 2030). The units are 10^{12} Btu.

The industry groups in the ICE Model are:

- Food
- Textiles
- Paper
- Chemicals
- Petroleum Refining
- Primary Metals
- Other

---

* Coal types (up to eleven) are defined by the model user.

Figure 2. Federal regions of the United States.

Total projected industrial boiler fossil fuel demand is an exogenous parameter because the ICE Model is one of a group of National Acid Precipitation Assessment Program (NAPAP)[1] sectoral emissions models. Input specifications for all of the NAPAP sectoral emissions models are coordinated by EPA and DOE in order that ICE Model results are compatible with other NAPAP sectoral emissions models.[2]

ICE MODEL VERSIONS

ICE Model development tasks were initiated in 1983. This report focuses on ICE Model Version 6.0.

SOFTWARE CHARACTERISTICS

As required by the EPA contract, the ICE Model was developed on the IBM 3090 Model 200 computer at EPA's National Computer Center in Research Triangle Park, North Carolina. All ICE Model computer programs have been written in FORTRAN77 and compiled using the FORTVCL procedure. However, an understanding of FORTRAN is not required to operate the ICE Model. The ICE Model operating instructions mainly require very minor and simple text editing of Job Control Language.

User-created ICE Model input files are explained in Section 2. The ICE Model WYLBUR operating instructions are summarized in Section 3. The ICE Model TSO operating instructions are summarized in Section 4. The ICE Model dataset naming conventions are described in Appendix A.

REFERENCES

1. National Acid Precipitation Assessment Program Annual Report, 1986. Washington, D.C.

2. Hanson, D., C. Macal, and D. South. Configuration Paper. 1985 Acid Precipitation Assessment. Energy/Economic Forecast Driver for the Task Group B Emissions Model Set. Argonne National Laboratory. Argonne, Illinois. October 5, 1984.

SECTION 2
INPUT DATA FILES

There are four user-created ICE Model input files:

- NSPS assumptions
- SO_2 SIP modification assumptions
- Projected industrial fuel prices by Federal region and fuel type, coal characteristics (sulfur, ash, and Btu content) by Federal region, and projected industrial boiler fossil fuel demand by State and industry group
- AFBC market penetration

NSPS ASSUMPTIONS

NSPS assumptions are stored in files labeled ICEMODEL.?.NSPSREGS.DATA where the question market in this file name is specified by the user (1-8 characters) when the file is created.* The record length of this file is 80 characters. It is read free-format (distinct data items must be separated by at least one blank) by the ICE Model.

This file contains national SO_2 emissions standards for coal and residual fuel oil combustion and PM emissions standards for coal combustion in new industrial boilers. These standards are defined by boiler size (8 classes) and expected annual capacity utilization (CU) rate (less or greater than 30 percent).

This file has 25 lines:

- Line 1: User-specified name, 1-8 characters; must correspond identically to the second qualifier (the question mark noted above) in the file name
- Line 2: "8" (do not change)
- Line 3: "30 50 75 100 150 200 250 1000" (do not change)
- Line 4: Residual fuel oil SO_2 emissions ceiling, greater than 0.3 CU

---

* Dataset naming conventions are described in Appendix A.

- Line 5: Residual fuel oil SO_2 emissions ceiling, less than or equal to 0.3 CU
- Line 6: Coal SO_2 emissions ceiling, greater than 0.3 CU
- Line 7: Coal SO_2 emissions ceiling, less than or equal to 0.3 CU
- Line 8: Coal PM emissions ceiling, greater than 0.3 CU
- Line 9: Coal PM emissions ceiling, less than or equal to 0.3 CU
- Line 10: Residual fuel oil SO_2 emissions floor, greater than 0.3 CU
- Line 11: Residual fuel oil SO_2 emissions floor, less than or equal to 0.3 CU
- Line 12: Recommended residual fuel oil SO_2 emissions removal rate, greater than 0.3 CU
- Line 13: Recommended residual fuel oil SO_2 emissions removal rate, less than or equal to 0.3 CU
- Line 14: Minimum residual fuel oil SO_2 emissions removal rate, greater than 0.3 CU
- Line 15: Minimum residual fuel oil SO_2 emissions removal rate, less than or equal to 0.3 CU
- Line 16: Low sulfur residual fuel oil exemption, greater than 0.3 CU
- Line 17: Low sulfur residual fuel oil exemption, less than or equal to 0.3 CU
- Line 18: Coal SO_2 emissions floor, greater than 0.3 CU
- Line 19: Coal SO_2 emissions floor, less than or equal to 0.3 CU
- Line 20: Recommended coal SO_2 emissions removal rate, greater than 0.3 CU
- Line 21: Recommended coal SO_2 emissions removal rate, less than or equal to 0.3 CU
- Line 22: Minimum coal SO_2 emissions removal rate, greater than 0.3 CU
- Line 23: Minimum coal SO_2 emissions removal rate, less than or equal to 0.3 CU
- Line 24: Low sulfur coal exemption, greater than 0.3 CU
- Line 25: Low sulfur coal exemption, less than or equal to 0.3 CU

"CU" refers to annual capacity utilization rate.

Table 1 summarizes, for each line, the units and parameter values to be used if there is no regulation. In lines 4 through 25, eight values must be entered for each line. These correspond with the eight boiler size classes in

TABLE 1. SPECIFICATIONS FOR ICE MODEL NSPS ASSUMPTIONS INPUT FILE

Line number(s)	Units	Parameter value[a]
4-9	(lb/MMBtu) x 100	9999.9
10, 11, 16-19, 24, 25	(lb/MMBtu) x 100	0.0
12-15, 20-23	Percentages[b]	0.0

[a] If there is no regulation.

[b] e.g., "70.0" or "90.0"

the ICE Model, from smallest to largest. The upper limit for each size class (MMBtu/hr) is noted in line 3.Lines 10 through 25 apply if it is assumed that new industrial residual fuel oil and/or coal boilers must scrub. Lines 16 and 17 permit low sulfur residual fuel oil exemptions from a mandatory scrubbing requirement. Lines 24 and 25 permit low sulfur coal exemptions from a mandatory scrubbing requirement.

If the minimum SO_2 emissions removal rate is non-zero, the corresponding SO_2 emissions floor must also be non-zero. The SO_2 emissions floor is usually less than the corresponding SO_2 emissions ceiling. The low sulfur exemption from the mandatory scrubbing requirement is usually less than or equal to the corresponding SO_2 emissions ceiling. The minimum SO_2 emissions removal rate must always be smaller than the recommended SO_2 emissions removal rate. The recommended SO_2 emissions removal rate can never exceed "90" and the recommended and minimum SO_2 emissions removal rates both must equal or exceed "50."

The SO_2 ceiling emission rates for coal are assumed to be based on a 30-day rolling average, not on an annual average.

An example listing of this file is presented in Table 2. This represents the current NSPS as of September 1987 (the date of this report).

SO_2 SIP MODIFICATION ASSUMPTIONS

Alternative nationwide SO_2 emissions standards for existing industrial residual fuel oil and coal boilers can also be specified. They override current SIPs if they are more stringent than current SIPs. These assumptions are stored in files labeled ICEMODEL.?.SIPMOD.DATA where the question mark in this file name is specified by the user (1-8 characters) when the file is created. It is read free-format (distinct data items must be separated by at least one blank) by the ICE Model.

There are 16 parameter values in this file: eight boiler size classes times two fuel types (residual fuel oil and coal). There are only two lines in this file. Residual fuel oil assumptions are listed in line 1. Coal assumptions are listed in line 2. The eight values in each line represent the eight boiler size classes in the ICE Model (from smallest to largest). The units are (lb SO_2/MMBtu) x 100.0 and "999.0" should be entered for each value where there

TABLE 2. CURRENT NSPS FILE

```
COMMAND? USE ICEMODEL.CURNSPS.NSPSREGS.DATA CLR
COMMAND? L
```

1.	CURNSPS							
2.	8							
3.	30	50	75	100	150	200	250	1000
4.	7*9999.9		80.0					
5.	7*9999.9		80.0					
6.	7*9999.9		120.0					
7.	7*9999.9		120.0					
8.	4*9999.9		4*5.0					
9.	4*9999.9		4*5.0					
10.	8*0.0							
11.	8*0.0							
12.	8*0.0							
13.	8*0.0							
14.	8*0.0							
15.	8*0.0							
16.	8*0.0							
17.	8*0.0							
18.	8*0.0							
19.	8*0.0							
20.	8*0.0							
21.	8*0.0							
22.	8*0.0							
23.	8*0.0							
24.	8*0.0							
25.	8*0.0							

```
COMMAND?
```

is no regulation. The coal SO_2 emissions ceilings in this file are on an annual average basis.

Tables 3 and 4 present some examples. File ICEMODEL.CRNTSIP.SIPMOD.DATA is used if it is assumed that there will be no Federal SO_2 emissions standards for existing boilers. File ICEMODEL.CASE1.SIPMOD.DATA assumes that the national SO_2 emission standard for all existing industrial residual fuel oil boilers is 0.8 lb/MMBtu and 1.2 lb/MMBtu (annual average) for existing industrial coal boilers.

DEMSCEN

ICEMODEL.?.DEMSCEN.DATA is a user-created ICE Model input file which includes:

- Projected industrial fuel prices by Federal region and fuel type (1980-2040 in five-year increments)
- Coal characteristics (sulfur, ash, and Btu content) by Federal region
- Projected total industrial boiler fossil fuel demand by State and industry group

Fuel types are:

- Natural gas
- Distillate fuel oil
- Residual fuel oil
  - 3.0 percent sulfur
  - 1.6 percent sulfur
  - 0.8 percent sulfur
  - 0.3 percent sulfur
- Coal (up to eleven distinct types for each Federal region)

The industry groups are:

- Food
- Textiles
- Paper
- Chemicals
- Petroleum Refining
- Primary Metals
- Other

TABLE 3. ALTERNATIVE SO_2 SIP MODIFICATION ASSUMPTIONS

```
COMMAND? USE ICEMODEL.CRNTSIP.SIPMOD.DATA
COMMAND? L

    1.    8*999.0
    2.    8*999.0

COMMAND?
```

TABLE 4. ALTERNATIVE SO_2 SIP MODIFICATION ASSUMPTIONS

```
COMMAND? USE ICEMODEL.CASE1.SIPMOD.DATA
COMMAND? L

    1.    8*80.0
    2.    8*120.0

COMMAND?
```

The second qualifier (question mark) in this file name is defined by the user (1-8 characters) when the file is created. Tables 5 through 10 present the various formats used in this file.

All data should be right-justified in each field when entered. Blank columns should be on the left of each number. Decimal points must not be entered in columns 1 through 10. If a certain fuel type does not apply in a given Federal region (for example, perhaps only 9 of the possible 11 coal types are used), enter "9999.9" as the fuel price and " 0.0" for the characteristics (if coal). The scenario code should be identical throughout the file. This file is relatively large. The order is immaterial.

- Reference Table 5:
  49 States* x 7 years x 7 industry codes = 2,401 rows
- Reference Tables 6 and 7:
  10 regions x 13 years = 130 rows each
- Reference Tables 8 through 10:
  10 rows each

There are a total of 2,691 rows (2,401 + 130 + 130 + 10 + 10 + 10).

ICF Incorporated has defined nine industrial coal types and projected coal prices for EPA's industrial boiler NSPS analysis. The average sulfur, ash, and Btu content values are presented in Table 12. Note that all nine industrial coal types are not available in all ten Federal regions.** Note that Table 12 follows the file formats shown in Tables 8 through 10. The order of the data presented in Table 12 is immaterial.

AFBC MARKET PENETRATION

The AFBC market penetration estimates are stored in files labeled ICEMODEL.FIXED.RYEARXX.DATA where "XX" is 85, 90, 95, 00, 10, 20 or 30. The parameter is a fraction of total new coal boilers with SO_2 emissions control equipment. Values must be $\geq$ 0.0 and $\leq$ 1.0 and they can be unique for each of the run years. The default value is 0.0, the third parameter in these data files.

---

* Including the District of Columbia. Excluding Alaska and Hawaii.

** Coal types 1 and 8 are not used. Coal types 2-7 are bituminous coals. Coal types 9-11 are subbituminous coals.

TABLE 5. DEMSCEN FORMAT: TOTAL PROJECTED INDUSTRIAL BOILER FOSSIL FUEL DEMAND

Columns	Contents
1-2	FIPS State code[a,b]
3	"1"
4-7	Year ("1985" or "1990" or "1995" or "2000" or "2010" or "2020" or "2030")[b,c]
8	Industry code[b,d]
9-10	Scenario code[e]
11-16	Total projected industrial boiler fossil fuel demand (10^{12} Btu)[f]
17-80	Blank

[a] See Table 11.

[b] The order is immaterial.

[c] Values must be entered for all seven years.

[d] "1" - Food; "2" - Textiles; "3" - Paper; "4" - Chemicals; "5" - Petroleum Refining; "6" - Primary Metals; "7" - Other.

[e] User-specified.

[f] Includes sum of coal, distillate and residual fuel oil, and natural gas. Use two decimal places (e.g., 50789 billion Btu would be input as "50.79").

TABLE 6. DEMSCEN FORMAT: PROJECTED INDUSTRIAL OIL AND GAS PRICES

Columns	Contents
1-2	Federal region ("01" or "02" or ... or "10")[a]
3	"2"
4-7	Year ("1980" or "1985" or "1990" or "1995" or "2000" or "2005" or "2010" or "2015" or "2020" or "2025" or "2030" or "2035" or "2040")[a,b]
8	Blank
9-10	Scenario code[c]
11-16	Distillate fuel oil price (1980 ¢/MMBtu)[d]
17-22	0.3 percent S residual fuel oil (1980 ¢/MMBtu)[d]
23-28	0.8 percent S residual fuel oil (1980 ¢/MMBtu)[d]
29-34	1.6 percent S residual fuel oil (1980 ¢/MMBtu)[d]
35-40	3.0 percent S residual fuel oil (1980 ¢/MMBtu)[d]
41-46	Natural gas price (1980 ¢/MMBtu)[d]
47-80	Blank

[a] The order is immaterial.

[b] Values must be entered for all 13 years.

[c] User-specified.

[d] With one decimal place (e.g., $3.15/MMBtu would be input as "315.0").

TABLE 7. DEMSCEN FORMAT: PROJECTED INDUSTRIAL COAL PRICES

Columns	Contents
1-2	Federal region ("01" or "02" or ... or "10")[a]
3	"3"
4-7	Year ("1980" or "1985" or "1990" or "1995" or "2000" or "2005" or "2010" or "2015" or "2020" or "2025" or "2030" or "2035" or "2040")[a,b]
8	Blank
9-10	Scenario code[c]
11-16	Coal type 1 (1980 ¢/MMBtu)[d]
17-22	Coal type 2 (1980 ¢/MMBtu)[d]
23-28	Coal type 3 (1980 ¢/MMBtu)[d]
29-34	Coal type 4 (1980 ¢/MMBtu)[d]
35-40	Coal type 5 (1980 ¢/MMBtu)[d]
41-46	Coal type 6 (1980 ¢/MMBtu)[d]
47-52	Coal type 7 (1980 ¢/MMBtu)[d]
53-58	Coal type 8 (1980 ¢/MMBtu)[d]
59-64	Coal type 9 (1980 ¢/MMBtu)[d]
65-70	Coal type 10 (1980 ¢/MMBtu)[d]
71-76	Coal type 11 (1980 ¢/MMBtu)[d]
77-80	Blank

[a] The order is immaterial.

[b] Values must be entered for all 13 years.

[c] User-specified.

[d] With one decimal place (e.g., $2.15/MMBtu would be input as "215.0").

TABLE 8. DEMSCEN FORMAT: COAL SULFUR CONTENT

Columns	Contents
1-2	Federal region ("01" or "02" or ... or "10")[a]
3	"4"
4-8	Blank
9-10	Scenario code[b]
11-16	Coal type 1 (percent sulfur)
17-22	Coal type 2 (percent sulfur)
23-28	Coal type 3 (percent sulfur)
29-34	Coal type 4 (percent sulfur)
35-40	Coal type 5 (percent sulfur)
41-46	Coal type 6 (percent sulfur)
47-52	Coal type 7 (percent sulfur)
53-58	Coal type 8 (percent sulfur)
59-64	Coal type 9 (percent sulfur)
65-70	Coal type 10 (percent sulfur)
71-76	Coal type 11 (percent sulfur)
77-80	Blank

[a] The order is immaterial.

[b] User-specified.

TABLE 9. DEMSCEN FORMAT: COAL BTU CONTENT

Columns	Contents
1-2	Federal region ("01" or "02" or ... or "10")[a]
3	"5"
4-8	Blank
9-10	Scenario code[b]
11-16	Coal type 1 (Btu/pound)
17-22	Coal type 2 (Btu/pound)
23-28	Coal type 3 (Btu/pound)
29-34	Coal type 4 (Btu/pound)
35-40	Coal type 5 (Btu/pound)
41-46	Coal type 6 (Btu/pound)
47-52	Coal type 7 (Btu/pound)
53-58	Coal type 8 (Btu/pound)
59-64	Coal type 9 (Btu/pound)
65-70	Coal type 10 (Btu/pound)
71-76	Coal type 11 (Btu/pound)
77-80	Blank

[a] The order is immaterial.

[b] User-specified.

TABLE 10. DEMSCEN FORMAT: COAL ASH CONTENT

Columns	Contents
1-2	Federal region ("01" or "02" or ... or "10")[a]
3	"6"
4-8	Blank
9-10	Scenario code[b]
11-16	Coal type 1 (percent ash)
17-22	Coal type 2 (percent ash)
23-28	Coal type 3 (percent ash)
29-34	Coal type 4 (percent ash)
35-40	Coal type 5 (percent ash)
41-46	Coal type 6 (percent ash)
47-52	Coal type 7 (percent ash)
53-58	Coal type 8 (percent ash)
59-64	Coal type 9 (percent ash)
65-70	Coal type 10 (percent ash)
71-76	Coal type 11 (percent ash)
77-80	Blank

[a] The order is immaterial.

[b] User-specified.

TABLE 11. NATIONAL BUREAU OF STANDARDS
FEDERAL INFORMATION PROCESSING STANDARDS (FIPS)
STATE CODES[a]

01	Alabama	23	Maine	40	Oklahoma
04	Arizona	24	Maryland	41	Oregon
05	Arkansas	25	Massachusetts	42	Pennsylvania
06	California	26	Michigan	44	Rhode Island
08	Colorado	27	Minnesota	45	South Carolina
09	Connecticut	28	Mississippi	46	South Dakota
10	Delaware	29	Missouri	47	Tennessee
11	D.C.	30	Montana	48	Texas
12	Florida	31	Nebraska	49	Utah
13	Georgia	32	Nevada	50	Vermont
16	Idaho	33	New Hampshire	51	Virginia
17	Illinois	34	New Jersey	53	Washington
18	Indiana	35	New Mexico	54	West Virginia
19	Iowa	36	New York	55	Wisconsin
20	Kansas	37	North Carolina	56	Wyoming
21	Kentucky	38	North Dakota		
22	Louisiana	39	Ohio		

[a] Used in Table 5.

TABLE 12. COAL CHARACTERISTICS

14	.0	0.638	0.926	1.401	1.973	2.807	3.608	0.0	0.0	0.0	0.0
24	.0	0.625	0.915	1.396	1.958	2.807	3.674	0.0	0.0	0.0	0.0
34	.0	0.632	0.922	1.391	1.901	2.730	3.624	0.0	0.0	0.0	0.0
44	.0	0.636	0.925	1.392	1.865	2.582	3.309	0.0	0.0	0.0	0.0
54	.0	0.626	0.912	1.291	1.723	2.504	3.400	0.0	0.441	0.641	0.966
64	.0	0.621	0.751	1.125	1.821	2.649	3.483	0.0	0.429	0.622	0.938
74	.0	0.597	0.884	1.317	1.717	2.492	3.353	0.0	0.425	0.617	0.931
84	.0	0.543	0.750	1.126	0.0	0.0	0.0	0.0	0.439	0.626	0.944
94	.0	0.525	0.734	1.076	0.0	0.0	0.0	0.0	0.463	0.672	1.013
104	.0	0.547	0.795	1.198	0.0	0.0	0.0	0.0	0.475	0.698	1.040
15	.0	12750	12750	12800	13150	12850	12375	0.0	0.0	0.0	0.0
25	.0	12500	12600	12750	13050	12850	12600	0.0	0.0	0.0	0.0
35	.0	12645	12700	12710	12670	12500	12430	0.0	0.0	0.0	0.0
45	.0	12720	12735	12720	12430	11820	11350	0.0	0.0	0.0	0.0
55	.0	12525	12550	11795	11485	11465	11660	0.0	8825	8825	8825
65	.0	12415	10335	10276	12135	12130	11945	0.0	8570	8570	8570
75	.0	11930	12165	12030	11445	11410	11500	0.0	8500	8500	8500
85	.0	10850	10330	10285	0.0	0.0	0.0	0.0	8770	8620	8620
95	.0	10505	10100	9825	0.0	0.0	0.0	0.0	9250	9250	9250
105	.0	10940	10940	10940	0.0	0.0	0.0	0.0	9500	9500	9500
16	.0	11.9	11.9	13.0	13.0	13.0	13.0	0.0	0.0	0.0	0.0
26	.0	11.9	11.9	11.4	13.0	13.0	13.0	0.0	0.0	0.0	0.0
36	.0	11.8	12.4	12.6	12.2	13.0	13.0	13.0	0.0	0.0	0.0
46	.0	11.7	12.3	12.3	11.9	11.9	11.8	0.0	0.0	0.0	0.0
56	.0	11.0	11.0	10.5	10.9	12.2	12.0	0.0	6.9	6.9	6.9
66	.0	12.1	11.8	15.0	11.8	12.2	12.3	0.0	7.3	7.3	7.3
76	.0	10.0	12.4	12.4	11.1	11.1	11.1	0.0	6.0	6.0	6.0
86	.0	10.0	10.0	10.0	0.0	0.0	0.0	0.0	8.4	6.9	6.9
96	.0	11.3	11.3	16.3	0.0	0.0	0.0	0.0	7.3	7.3	7.3
106	.0	10.0	10.0	10.0	0.0	0.0	0.0	0.0	10.0	10.0	10.0

SECTION 3
OPERATING INSTRUCTIONS: WYLBUR

INTRODUCTION

The ICE Model can be run for 1985, 1990, 1995, 2000, 2010, 2020, and 2030 (referred to as run years or as model years). These years must be run in sequence. The current base year in the ICE Model Version 6.0 is 1980.

Two jobs must be run for each model year. The first job (referred to as a "creation" run) projects the characteristics of industrial fossil fuel-fired boilers (e.g., new/existing, size, location, local air emission regulations). The second job (referred to as a fuel choice run) makes "fuel choice" decisions and determines air emission rates and costs for each group of boilers in the population.

Figure 3 presents the sequence of ICE Model jobs. Fifteen jobs are required to run all seven model years and print the standard output tables. They must be run in the following sequence:

- CREATE6 for 1985
- FLCH6 for 1985
- CREATE6 for 1990
- FLCH6 for 1990
- CREATE6 for 1995
- FLCH6 for 1995
- CREATE6 for 2000
- FLCH6 for 2000
- CREATE6 for 2010
- FLCH6 for 2010
- CREATE6 for 2020
- FLCH6 for 2020
- CREATE6 for 2030
- FLCH6 for 2030
- TABLE6

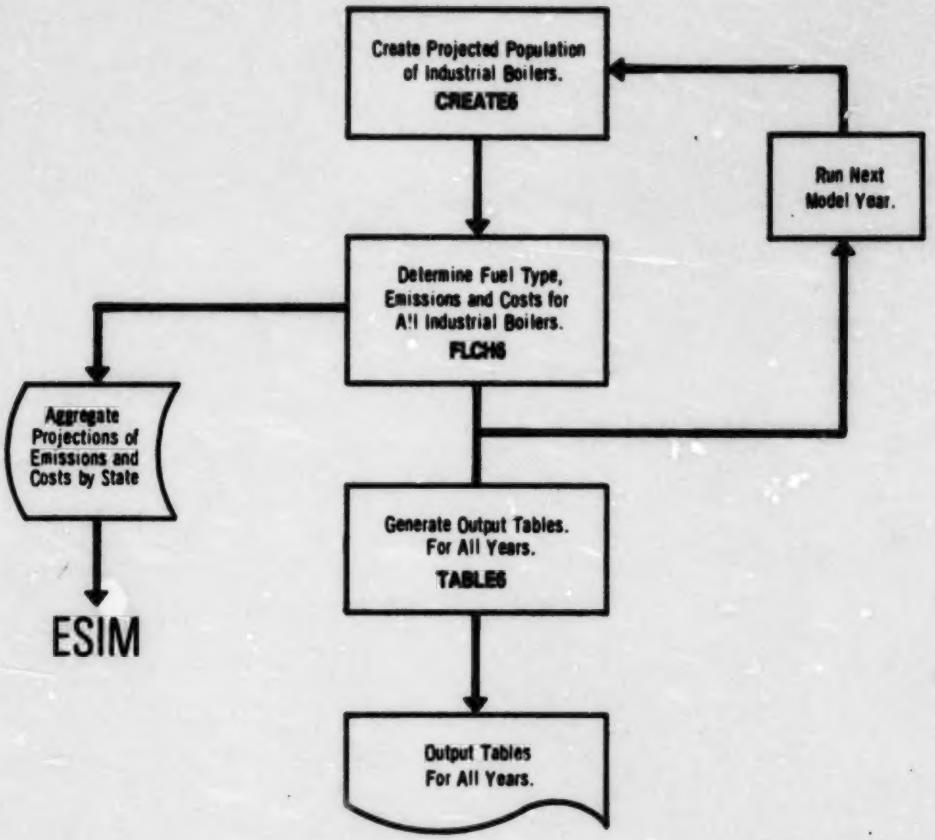
Create Projected Population of Industrial Boilers.
CREATE6
Run Next Model Year.
Determine Fuel Type, Emissions and Costs for All Industrial Boilers.
FLCH6
Aggregate Projections of Emissions and Costs by State
ESIM
Generate Output Tables. For All Years.
TABLE6
Output Tables For All Years.

Figure 3. ICE Model jobs.

CREATION RUN

The JCL needed to make a creation run is stored in file ICEMODEL.VERSION6.CREATE6.PROC (see Table 13). This is set up as an in-stream procedure. Datasets whose names can vary between creation runs are specified with symbolic parameters in lines 28 and 29. The remaining datasets have their full names specified explicitly since they will not vary between runs.

Lines 1 through 3 are system- and user-specific and will need to be modified by each user. Lines 28 and 29 must be edited and then the job can be submitted. Table 14 presents a list of the symbolic parameters described below.

- CY: Current run year -- "85" must be run before "90", etc.
- PY: Previous run year -- every creation run needs to access data from the previous run year. The value for PY is a function of the value for CY.
  - if CY=85, PY=80
  - if CY=90, PY=85
  - if CY=95, PY=90
  - if CY=00, PY=95
  - if CY=10, PY=00
  - if CY=20, PY=10
  - if CY=30, PY=20
- CYSC: Current years scenario code. User-specified with 1-6 characters. Helps to differentiate one set of runs from another. For example, CYSC=HPLGBC could represent high fuel price, low economic growth, base case environmental regulations. Another example is CYSC=RUN32. This scenario code is included in the name of ICE Model output files.
- PCRSC: What is the scenario code for the previous run year? If CY=85, PCRSC=BASE. This is true without exception. If CY=90, 95, 00, 10, 20, or 30, the PCRSC can be set to any scenario code (but is usually set to the value of CYSC). The value of PCRSC determines which set of output files from previous runs will be input files for the current run.
- PFRSC: What is the scenario code for the previous fuel choice run? If CY=85, PFRSC=BASE. This is true without exceptions. If CY=90, 95, 00, 10, 20, or 30, then PFRSC can be set to any scenario code (as discussed

TABLE 13. CREATE6 JCL

```
1.    //MSLCREAT JOB (ACCOUNT ID,PIN NO),TIME=(,30)
2.    /*CPUID EPA3
3.    /*ROUTE PRINT N3
4.    //CREATE6 PROC
5.    //    EXEC PGM=CREATE6,REGION=1000K
6.    //STEPLIB DD DSN=MSLICEM.ICEMODEL.LOADLIB.OBJ,DISP=SHR
7.    //FT01F001 DD DSN=MSLICEM.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
8.    //FT02F001 DD DSN=MSLICEM.ICEMODEL.&SM..SIPMOD.DATA,DISP=SHR
9.    //FT03F001 DD DSN=MSLICEM.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
10.   //FT04F001 DD DSN=MSLICEM.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
11.   //    DISP=(,CATLG,DELETE),UNIT=DISK,
12.   //    SPACE=(TRK,(30,5),RLSE),
13.   //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
14.   //FT06F001 DD SYSOUT=A
15.   //FT08F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..BLRAFC4.DATA,DISP=SHR
16.   //FT09F001 DD DSN=MSLICEM.ICEMODEL.&CYSC..BLRPOP.DATA,
17.   //    DISP=(,CATLG,DELETE),UNIT=DISK,
18.   //    SPACE=(TRK,(250,20),RLSE),
19.   //    DCB=(DSORG=PS,RECFM=FB,LRECL=158,BLKSIZE=15800)
20.   //FT10F001 DD DSN=MSLICEM.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
21.   //FT11F001 DD DSN=MSLICEM.ICEMODEL.FIXED.AQCRCDF.DATA,DISP=SHR
22.   //FT12F001 DD DSN=MSLICEM.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
23.   //FT13F001 DD DSN=MSLICEM.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
24.   //FT16F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
25.   //FT17F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
26.   //    PEND
27.   //STEP01 EXEC CREATE6,
28.   //    CY=85,PY=80,CYSC=BASE87,PCRSC=BASE,PFRSC=BASE,
29.   //    DS=EEAMID,SM=CRNTSIP
```

TABLE 14. CREATION RUN PARAMETERS

Parameter	Possible Values	Comments
CY	85, 90, 95, 00, 10, 20, 30	Current run year: 1985, 1990, 1995, 2000, 2010, 2020, or 2030
CYSC	User-specified	Current year scenario code (1-6 characters)
PY	80, 85, 90, 95, 00, 10, 20	Previous run year: 1980, 1985, 1990, 1995, 2000, 2010, or 2020
PCRSC	BASE or user-specified	Previous creation run scenario code; must be BASE for a 1985 creation run; otherwise, should be the same as the value for CYSC
PFRSC	BASE or user-specified	Previous fuel choice run scenario code; must be BASE in a 1985 creation run; otherwise, should be the same as the value for CYSC
DS	User-specified	Demand scenario (1-8 characters)
SM	User-specified	SIP modifications (1-8 characters)

above for PCRSC). The value of PFRSC determines which set of output files on the disk from previous runs will be input files for the current job.

The parameters listed above are used in the labels of ICE Model output files. Two other parameters are used to specify ICE Model input files created by the model user. ICE Model input files are explained in Section 2.

- DS: Demand scenario. Every creation run needs a forecast of total industrial fossil fuel demand in industrial boilers by State and industry group.
- SM: SIP modifications. An ICE Model user option is the capability to override local SO_2 emissions regulations for existing industrial boilers with a Federal nationwide SO_2 emissions standard.

Table 13 presents an example setup for a 1985 creation run (note in line 28 that "CY=85", "PY=80", "PCRSC=BASE", and "PFRSC=BASE"). CYSC=LSR, in line 28, should be replaced by a user-created current year scenario code. In line 29, "SM=CRNTSIP" indicates (from Table 3) that current SIPs are applicable (and are not replaced by a Federal SO_2 emission standard) for existing industrial residual fuel oil and coal boilers. In line 29, "DS=EEAMID" should be replaced by the proper user-created file name (see Section 2).

FUEL CHOICE RUN

File ICEMODEL.VERSION6.FLCH6.PROC contains the necessary JCL for a fuel choice run (see Table 15). Lines 1 through 3 are system- or user-specific and will need to be modified by each user. This is also set up as an in-stream procedure. The symbolic parameters in lines 33 and 34 must be edited and then the job can be submitted.

Table 16 presents a list of these parameters.

- PCRSC: This time, this parameter refers to a file created by the last creation run for the current run year. Set PCRSC equal to the same value as CYSC in the last creation run.
- ARO: This refers to a user-created ICE Model input file of NSPS assumptions (see Section 2). This file does not necessarily have to remain the same for all run years.*

* It is recommended that the file presented in Table 2 be used when CY=85.

TABLE 15. FLCH6 JCL

```
1.    //MSLFLCH6 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
2.    /*CPUID EPA3
3.    /*ROUTE PRINT N3
4.    //FLCH6 PROC
5.    //   EXEC PGM=FLCH6,REGION=1500K
6.    //STEPLIB DD DSN=MSLICEM.ICEMODEL.LOADLIB.OBJ,DISP=SHR
7.    //FT01F001 DD DSN=MSLICEM.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
8.    //FT02F001 DD DSN=MSLICEM.ICEMODEL.&CYSC..ESIM.DATA,
9.    //   DISP=(,CATLG,DELETE),UNIT=DISK,
10.   //   SPACE=(TRK,(10,10),RLSE),
11.   //   DCB=(DSORG=PS,LRECL=100,BLKSIZE=10000,RECFM=FB)
12.   //FT04F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..ESIM.DATA,DISP=SHR
13.   //FT05F001 DD DSN=MSLICEM.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
14.   //FT06F001 DD SYSOUT=A
15.   //FT08F001 DD DSN=MSLICEM.ICEMODEL.&CYSC&CY..BTURTC.DATA,
16.   //   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
17.   //   SPACE=(TRK,(5,5),RLSE),
18.   //   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
19.   //FT09F001 DD DSN=MSLICEM.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
20.   //FT10F001 DD DSN=MSLICEM.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
21.   //FT11F001 DD DSN=MSLICEM.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
22.   //FT13F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
23.   //FT14F001 DD DSN=MSLICEM.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
24.   //   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
25.   //   SPACE=(TRK,(250,25),RLSE),
26.   //   DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
27.   //FT15F001 DD DSN=MSLICEM.ICEMODEL.&ARO..NSPSREGS.DATA,DISP=SHR
28.   //FT16F001 DD DSN=MSLICEM.ICEMODEL.&CYSC&CY..NUMCOL.DATA,
29.   //   DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
30.   //   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
31.   //      PEND
32.   //B EXEC FLCH6,
33.   //   CY=85,FY=80,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE,
34.   //   DS=EEAMID,ARO=CURRENT,FO=Y
```

TABLE 16. FUEL CHOICE RUN PARAMETERS

Parameter	Possible values	Comments
CY, CYSC, PY, PFRSC, DS	User-specified	See Table 14
PCRSC	User-specified	Must be identical to value for CYSC in last creation run
ARO	User-specified	Alternative NSPS (1-8 characters)
FO	Y, N	Fuel choice option for new industrial boilers; Y - EEA fuel choice decision module,[a] N - least-cost basis[b]

[a] "Y" is the standard operating procedure. This option selects the statistical fuel choice decision logic (that is, the probability of selecting coal for a new boiler is a function of boiler size, previous coal experience, region and capital, O&M and fuel cost estimates).

[b] Comparison of total after-tax net present value (capital, O&M, and fuel).

- FO: Fuel choice decision criteria option. If "FO=Y", the fuel choice decision criterion for new industrial boilers is based on an analysis of recent industrial boiler sales data and is a function of expected cost differences, previous coal experience, region, and boiler firing rate (size). This is the standard operating procedure. If "FO=N", the fuel choice decision criterion for new industrial boilers is based on the lowest cost (total after-tax capital, O&M and fuel) alternative.

Every execution of FLCH6 creates an output file which contains aggregate forecasts of emissions and costs by State. This ICE Model output file is an input file for EPA's Emissions Strategy Integration Model (ESIM). ESIM was developed for EPA by E.H. Pechan and Associates, Inc. This ICE Model output file is labeled ICEMODEL._ _ _ _ _ _.ESIM.DATA where the blanks contain the current year scenario code (value for CYSC).

The file format was specified by Phil Childress (E.H. Pechan and Associates, Inc.) in a memorandum dated April 23, 1984. See Tables 17-19. The ICE Model does not fill in values for columns 1, 9, 10, and 11 (see Table 17). These columns should be edited by the user before this data file is read by ESIM. The source sector code in this file (column 8 in Table 17) is always "B" (see Table 18). VOC emissions projections are not an ICE Model output feature. The ICE Model does project SO_2, SO_4, and NO_x emissions (see Table 19).

Table 15 presents an example set-up for a 1985 fuel choice run (note in line 33 that "CY=85", "PY=80", and "PFRSC=BASE"). The values for CYSC and DS in Table 15 are the same as the values for CYSC and DS in Table 13. The ARO file name shown in line 34 in Table 15 is recommended for all 1985 fuel choice runs (see Table 2). Note also in line 34 that "FO=Y", the standard ICE Model operating procedure.

RUNNING ALL YEARS

Usually, the user will want to run all seven model years. This can be accomplished as follows:

1) Edit the JCL file for a 1985 creation run to assign proper parameter values
2) Submit the JCL

TABLE 17. REVISED ESIM DATA INPUTS 4/4/84

Columns	Format	Contents
1	A1	Global economic/growth scenario code (e.g., M, L, H)
2-5	I4	Case year (e.g., 1995)
6-7	A2	State FIPS (alpha - e.g., OH, TX)
8	A1	Source sector code (e.g., E or B)
9-10	A1	Policy class code (e.g., SC)
11	A2	Policy severity level 1, 2, 3...0, A, B, C...Z, sorted by increasing cost
12	A1	Primary pollutant label (S, T, N, or V)
13-18	F6.0	Primary pollutant emissions (KTons)
19	A1	Second pollutant label*
20-25	F6.0	Second pollutant emissions (KTons)
26	A1	Third pollutant label*
27-32	F6.0	Third polutant emissions (KTons)*
33	A1	Fourth pollutant label*
34-39	F6.0	Fourth pollutant emissions (KTons)*
40-47	F8.2	Total annualized cost for control strategy in millions of 1980 dollars. This cost subsumes the next three costs, as your model calculates it.
48-55	F8.2	Present value of total cumulative (to case year) capital investment for the control strategy, in millions of 1980 dollars.
56-63	F8.2	Total annualized operating and maintenance cost for case year, (fixed and variable) excluding fuel or fuel related penalties, in real 1980 dollars.
64-71	F8.2	Total actual case year annual fuel costs and fuel-related cost penalties for the control strategy, in real 1980 dollars.

Example:

```
    2    6         11
(S)(1995)(OH)(E)(PC)(L)

12         19         26         33
(S)(XXXXX.)(T)(XXXXX.)(N)(XXXXX.)(V)(XXXXX.)

40         48         56         64
(XXXXX.XX)(XXXXX.XX)(XXXXX.XX)(XXXXX.XX)
```

* If any. Otherwise blank.

TABLE 18. SOURCE SECTOR CODES

Code	Meaning
E	Electric utilities (AUSM)
B	Industrial boilers (ICE)
H	Industrial process heaters (PROMPT)
P	Industrial process sources of SO_2 and NO_x
S	Stationary sources of VOCs
T	Mobile sources (Transportation)
R	Residential and commercial sources
O	Other sources

Revised 4-4-84

TABLE 19. INPUT SCENARIO AND POLLUTANT CODES

Type	Code	Meaning
Input scenario	M	NEPP 1983 medium GNP
	L	NEPP 1983 low GNP
	H	NEPP 1983 high GNP
	(others as required)	
Pollutant	S	SO_2
	T	SO_4
	N	NO_x
	V	VOC

revised 4-4-84

3) Wait for job to finish executing
4) Edit the JCL for a 1985 fuel choice run
5) Submit the JCL
6) Wait for job to finish executing
7) Repeat steps 1-6 for 1990, 1995, 2000, 2010, 2020, and 2030
8) Submit the output table JCL

Table 20 summarizes all of the ICE Model user options. In general, the same demand scenario (DS) file and current year scenario code (CYSC) will be used in all 15 jobs.

Alternatively, the user may edit one JCL file which will submit the necessary 15 jobs in the proper order. The file with this JCL is ICEMODEL.VERSION6.ALLYEARS.PROC (see Table 21). It consists simply of the in-stream procedures for each of the 15 jobs (as described in the previous sections) concatenated to each other in the proper order (i.e., 1985 creation, followed by 1985 fuel choice, followed by 1990 creation, etc.). Although the symbolic parameters for each of the 15 jobs must still be set to their proper values by the user,* this "all-years" file speeds the process considerably. When the values are set, a single run command will submit all 15 jobs in the correct sequence. The first three lines in each step of the JCL are system- or user-specific and will need to be modified before use.

OUTPUT TABLES

After running the ICE Model for all seven model years and using the same value for parameter CYSC in each year, the user may produce output tables summarizing the results. The JCL to do this is also set up as an in-stream procedure, and is found in ICEMODEL.VERSION6.TABLE6.PROC (see Table 22). The first three lines in this JCL are system- or user-specific and will need to be modified by the user. The only symbolic parameter used is CYSC (line 19). It should be given the value which was used for CYSC in each of the 14 jobs making up the seven-year (1985, 1990, 1995, 2000, 2010, 2020, and 2030) ICE Model run the user wishes to summarize. A scenario title may be included in line 22 (up

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* The following parameters do not need to be changed from the values currently given them in this file: 1) CY and PY in all jobs, 2) PCRSC and PFRSC in the 1985 creation run, and 3) PFRSC in the 1985 fuel choice run.

TABLE 20. ICE MODEL RUN SPECIFICATIONS CHECKLIST

1. 1985 Creation Run

   CY=85, PY=80, CYSC=_____, PCRSC=BASE, PFRSC=BASE,
   DS=_ _ _ _ _ _ _ _, SM=CRNTSIP

2. 1985 Fuel Choice Run

   CY=85, PY=80, CYSC=_____, PCRSC=_ _ _ _ _ _, PFRSC-BASE,
   DS=_ _ _ _ _ _ _ _, ARO=CURRENT, FO=Y

3. 1990 Creation Run

   CY=90, PY=85, CYSC=_ _ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
   DS=_ _ _ _ _ _ _ _, SM=_ _ _ _ _ _ _ _

4. 1990 Fuel Choice Run

   CY=90, PY=85, CYSC=_ _ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
   DS=_ _ _ _ _ _ _ _, ARO=_ _ _ _ _ _ _ _, FO=Y

5. 1995 Creation Run

   CY=95, PY=90, CYSC=_ _ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
   DS=_ _ _ _ _ _ _ _, SM=_ _ _ _ _ _ _ _

6. 1995 Fuel Choice Run

   CY=95, PY=90, CYSC=_ _ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
   DS=_ _ _ _ _ _ _ _, ARO=_ _ _ _ _ _ _ _, FO=Y

7. 2000 Creation Run

   CY=00, PY=95, CYSC=_ _ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
   DS=_ _ _ _ _ _ _ _, SM=_ _ _ _ _ _ _ _

8. 2000 Fuel Choice Run

   CY=00, PY=95, CYSC=_ _ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
   DS=_ _ _ _ _ _ _ _, ARO=_ _ _ _ _ _ _ _, FO=Y

TABLE 20. ICE MODEL RUN SPECIFICATIONS CHECKLIST (cont'd)

9. 2010 Creation Run

CY=10, PY=00, CYSC=_ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
DS=_ _ _ _ _ _ _ _, SM=_ _ _ _ _ _ _ _

10. 2010 Fuel Choice Run

CY=10, PY=00, CYSC=_ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
DS=_ _ _ _ _ _ _ _, ARO=_ _ _ _ _ _ _ _, FO=Y

11. 2020 Creation Run

CY=20, PY=10, CYSC=_ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
DS=_ _ _ _ _ _ _ _, SM=_ _ _ _ _ _ _ _

12. 2020 Fuel Choice Run

CY=20, PY=10, CYSC=_ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
DS=_ _ _ _ _ _ _ _, ARO=_ _ _ _ _ _ _ _, FO=Y

13. 2030 Creation Run

CY=30, PY=20, CYSC=_ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
DS=_ _ _ _ _ _ _ _, SM=_ _ _ _ _ _ _ _

14. 2030 Fuel Choice Run

CY=30, PY=20, CYSC=_ _ _ _ _, PCRSC=_ _ _ _ _ _, PFRSC=_ _ _ _ _ _,
DS=_ _ _ _ _ _ _ _, ARO=_ _ _ _ _ _ _ _, FO=Y

15. Output Tables

CYSC=_ _ _
scenario title (less than 41 characters)

TABLE 21. COMPOSITE JCL

```
1.  //MSLIC601 JOB (ACCOUNT ID,BIN NO),TIME=(,30)
2.  /*CPUID EPA3
3.  /*ROUTE PRINT MS
4.  //CREATE6 PROC
5.  //    EXEC PGM=CREATE6,REGION=1000K
6.  //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
7.  //FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
8.  //FT02F001 DD DSN=MSLICEN.ICEMODEL.&SN..SIPWOD.DATA,DISP=SHR
9.  //FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
10. //FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
11. //    DISP=(,CATLG,DELETE),UNIT=DISK,
12. //    SPACE=(TRK,(30,5),RLSE),
13. //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
14. //FT06F001 DD SYSOUT=A
15. //FT08F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BLRAFC4.DATA,DISP=SHR
16. //FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,
17. //    DISP=(,CATLG,DELETE),UNIT=DISK,
18. //    SPACE=(TRK,(250,20),RLSE),
19. //    DCB=(DSORG=PS,RECFM=FB,LRECL=158,BLKSIZE=15800)
20. //FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
21. //FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AGCRCDF.DATA,DISP=SHR
22. //FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
23. //FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
24. //FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
25. //FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..MUNCOL.DATA,DISP=SHR
26. //    PEND
27. //STEP01 EXEC CREATE6,
28. //    CY=85,PY=80,CYSC=BASE87,PCRSC=BASE,PFRSC=BASE,
29. //    DS=EEANID,SN=CRNTSIP
30. //MSLIC602 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
31. /*CPUID EPA3
32. /*ROUTE PRINT MS
33. /*AFTER   MSLIC601
34. //FLCM6 PROC
35. //    EXEC PGM=FLCM6,REGION=1500K
36. //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
37. //FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
38. //FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,
39. //    DISP=(,CATLG,DELETE),UNIT=DISK,
40. //    SPACE=(TRK,(10,10),RLSE),
41. //    DCB=(DSORG=PS,LRECL=100,BLKSIZE=10000,RECFM=FB)
42. //FT04F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..ESIN.DATA,DISP=SHR
43. //FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
44. //FT06F001 DD SYSOUT=A
45. //FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
46. //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
47. //    SPACE=(TRK,(5,5),RLSE),
48. //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
49. //FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
50. //FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
51. //FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
52. //FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..MUNCOL.DATA,DISP=SHR
53. //FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
54. //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
55. //    SPACE=(TRK,(250,25),RLSE),
56. //    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
57. //FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..NSPSREGS.DATA,DISP=SHR
58. //FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..MUNCOL.DATA,
59. //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
60. //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
61. //        PEND
62. //B EXEC FLCM6,
63. //    CY=85,PY=80,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE,
64. //    DS=EEANID,ARO=CURRENT,FO=Y
```

TABLE 21. COMPOSITE JCL

```
65.   //MSLIC603 JOB (ACCOUNT ID,BIN NO),TIME=(1,30)
66.   /*CPUID EPA3
67.   /*ROUTE PRINT MS
68.   /*AFTER   MSLIC602
69.   //CREATE6 PROC
70.   //    EXEC PGM=CREATE6,REGION=1000K
71.   //STEPLIB DD DSN=MSLICEN.ICENMODEL.LOADLIB.OBJ,DISP=SHR
72.   //FT01F001 DD DSN=MSLICEN.ICENMODEL.&PCRSC&PY..STUPGP.DATA,DISP=SHR
73.   //FT02F001 DD DSN=MSLICEN.ICENMODEL.&SN..SIPMOD.DATA,DISP=SHR
74.   //FT03F001 DD DSN=MSLICEN.ICENMODEL.&DS..DENSCEN.DATA,DISP=SHR
75.   //FT04F001 DD DSN=MSLICEN.ICENMODEL.&CYSC&CY..STUPGP.DATA,
76.   //    DISP=(,CATLG,DELETE),UNIT=DISK,
77.   //    SPACE=(TRK,(30,5),RLSE),
78.   //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
79.   //FT06F001 DD SYSOUT=A
80.   //FT08F001 DD DSN=MSLICEN.ICENMODEL.&PCRSC&PY..BLRAPC4.DATA,DISP=SHR
81.   //FT09F001 DD DSN=MSLICEN.ICENMODEL.&CYSC..BLRPGP.DATA,DISP=OLD
82.   //FT10F001 DD DSN=MSLICEN.ICENMODEL.FIXED.SIZCLBIS.DATA,DISP=SHR
83.   //FT11F001 DD DSN=MSLICEN.ICENMODEL.FIXED.AGCRCDF.DATA,DISP=SHR
84.   //FT12F001 DD DSN=MSLICEN.ICENMODEL.FIXED.MEMSIP82.DATA,DISP=SHR
85.   //FT13F001 DD DSN=MSLICEN.ICENMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
86.   //FT14F001 DD DSN=MSLICEN.ICENMODEL.&PFRSC&PY..STURTC.DATA,DISP=SHR
87.   //FT17F001 DD DSN=MSLICEN.ICENMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
88.   //    PEND
89.   //STEP01 EXEC CREATE6,
90.   //    CY=90,PY=85,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE87,
91.   //    DS=EEAMID,SN=CRNTSIP
92.   //MSLIC604 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
93.   /*CPUID EPA3
94.   /*ROUTE PRINT MS
95.   /*AFTER   MSLIC603
96.   //FLCN6 PROC
97.   //    EXEC PGM=FLCN6,REGION=1500K
98.   //STEPLIB DD DSN=MSLICEN.ICENMODEL.LOADLIB.OBJ,DISP=SHR
99.   //FT01F001 DD DSN=MSLICEN.ICENMODEL.&DS..DENSCEN.DATA,DISP=SHR
100.  //FT02F001 DD DSN=MSLICEN.ICENMODEL.&CYSC..ESIN.DATA,DISP=MOD
101.  //FT05F001 DD DSN=MSLICEN.ICENMODEL.FIXED.PCOPT&PO..DATA,DISP=SHR
102.  //FT06F001 DD SYSOUT=A
103.  //FT08F001 DD DSN=MSLICEN.ICENMODEL.&CYSC&CY..STURTC.DATA,
104.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
105.  //    SPACE=(TRK,(3,5),RLSE),
106.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
107.  //FT09F001 DD DSN=MSLICEN.ICENMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
108.  //FT10F001 DD DSN=MSLICEN.ICENMODEL.FIXED.RETRCOST.DATA,DISP=SHR
109.  //FT11F001 DD DSN=MSLICEN.ICENMODEL.&PCRSC..BLRPGP.DATA,DISP=SHR
110.  //FT13F001 DD DSN=MSLICEN.ICENMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
111.  //FT14F001 DD DSN=MSLICEN.ICENMODEL.&CYSC&CY..BLRAPC4.DATA,
112.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
113.  //    SPACE=(TRK,(250,25),RLSE),
114.  //    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
115.  //FT15F001 DD DSN=MSLICEN.ICENMODEL.&ARO..RSPSREGS.DATA,DISP=SHR
116.  //FT16F001 DD DSN=MSLICEN.ICENMODEL.&CYSC&CY..NUMCOL.DATA,
117.  //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
118.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
119.  //        PEND
120.  //S EXEC FLCN6,
121.  //    CY=90,PY=85,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE87,
122.  //    DS=EEAMID,ARO=BASE87,PO=Y
```

TABLE 21. COMPOSITE JCL

```
123.  //HBLIC605 JOB (ACCOUNT ID,BIN NO),TIME=(1,30)
124.  /*CPUID EPA3
125.  /*ROUTE PRINT NJ
126.  /*AFTER   HBLIC604
127.  //CREATE6 PROC
128.  //    EXEC PGM=CREATE6,REGION=1000K
129.  //STEPLIB DD DSN=HBLICEN.ICENODEL.LOADLIB.OBJ,DISP=SHR
130.  //FT01F001 DD DSN=HBLICEN.ICENODEL.&PCRSCOPY..STUPOP.DATA,DISP=SHR
131.  //FT02F001 DD DSN=HBLICEN.ICENODEL.&BH..SIPHOD.DATA,DISP=SHR
132.  //FT05F001 DD DSN=HBLICEN.ICENODEL.&DS..DEMOCEN.DATA,DISP=SHR
133.  //FT06F001 DD DSN=HBLICEN.ICENODEL.&CYCSCY..STUPOP.DATA,
134.  //    DISP=(,CATLG,DELETE),UNIT=DISK,
135.  //    SPACE=(TRK,(30,5),RLSE),
136.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
137.  //FT08F001 DD SYSOUT=A
138.  //FT09F001 DD DSN=HBLICEN.ICENODEL.&PCRSCOPY..BLRAFC4.DATA,DISP=SHR
139.  //FT09F001 DD DSN=HBLICEN.ICENODEL.&CYSC..BLRPOP.DATA,DISP=OLD
140.  //FT10F001 DD DSN=HBLICEN.ICENODEL.FIXED.SIZCUBIS.DATA,DISP=SHR
141.  //FT11F001 DD DSN=HBLICEN.ICENODEL.FIXED.ABCRCDF.DATA,DISP=SHR
142.  //FT12F001 DD DSN=HBLICEN.ICENODEL.FIXED.HEMBIPB2.DATA,DISP=SHR
143.  //FT13F001 DD DSN=HBLICEN.ICENODEL.FIXED.RYEARACY..DATA,DISP=SHR
144.  //FT14F001 DD DSN=HBLICEN.ICENODEL.&PPRSCOPY..STURTC.DATA,DISP=SHR
145.  //FT17F001 DD DSN=HBLICEN.ICENODEL.&PPRSCOPY..HURCOL.DATA,DISP=SHR
146.  //    PEND
147.  //STEP01 EXEC CREATE6,
148.  //    CY=95,PY=90,CYSC=BASE87,PCRSC=BASE87,PPRSC=BASE87,
149.  //    DB=SEAHID,TM=CRETSIP
150.  //HBLIC606 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
151.  /*CPUID EPA3
152.  /*ROUTE PRINT NJ
153.  /*AFTER   HBLIC605
154.  //FLCM6 PROC
155.  //    EXEC PGM=FLCM6,REGION=1500K
156.  //STEPLIB DD DSN=HBLICEN.ICENODEL.LOADLIB.OBJ,DISP=SHR
157.  //FT01F001 DD DSN=HBLICEN.ICENODEL.&DS..DEMOCEN.DATA,DISP=SHR
158.  //FT02F001 DD DSN=HBLICEN.ICENODEL.&CYSC..ESIN.DATA,DISP=MOD
159.  //FT05F001 DD DSN=HBLICEN.ICENODEL.FIXED.PCOPT&PO..DATA,DISP=SHR
160.  //FT06F001 DD SYSOUT=A
161.  //FT08F001 DD DSN=HBLICEN.ICENODEL.&CYSC&CY..STURTC.DATA,
162.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
163.  //    SPACE=(TRK,(5,5),RLSE),
164.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
165.  //FT09F001 DD DSN=HBLICEN.ICENODEL.FIXED.RYEARACY..DATA,DISP=SHR
166.  //FT10F001 DD DSN=HBLICEN.ICENODEL.FIXED.RETRCOST.DATA,DISP=SHR
167.  //FT11F001 DD DSN=HBLICEN.ICENODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
168.  //FT13F001 DD DSN=HBLICEN.ICENODEL.&PPRSCOPY..HURCOL.DATA,DISP=SHR
169.  //FT14F001 DD DSN=HBLICEN.ICENODEL.&CYSC&CY..BLRAFC4.DATA,
170.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
171.  //    SPACE=(TRK,(250,25),RLSE),
172.  //    DCB=(DSORG=PS,LRECL=150,BLKSIZE=15000,RECFM=FB)
173.  //FT15F001 DD DSN=HBLICEN.ICENODEL.&ABD..HSPGREGS.DATA,DISP=SHR
174.  //FT16F001 DD DSN=HBLICEN.ICENODEL.&CYSC&CY..HURCOL.DATA,
175.  //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
176.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
177.  //        PEND
178.  //S EXEC FLCM6,
179.  //    CY=95,PY=90,CYSC=BASE87,PCRSC=BASE87,PPRSC=BASE87,
180.  //    DB=SEAHID,ABD=BASE87,PD=Y
```

TABLE 21. COMPOSITE JCL

```
181.  //MBLIC607 JOB (ACCOUNT ID,BIN NO),TIME=(1,30)
182.  /*CPUID EPA3
183.  /*ROUTE PRINT M3
184.  /*AFTER   MBLIC606
185.  //CREATE6 PROC
186.  //    EXEC PGM=CREATE6,REGION=1000K
187.  //STEPLIB DD DSN=MBLICEN.ICENODEL.LOADLIB.OBJ,DISP=SHR
188.  //FT01F001 DD DSN=MBLICEN.ICENODEL.&PCRSC&PY..STUPOP.DATA,DISP=SHR
189.  //FT02F001 DD DSN=MBLICEN.ICENODEL.&BN..BIPNOD.DATA,DISP=SHR
190.  //FT03F001 DD DSN=MBLICEN.ICENODEL.&DS..DEMSCEN.DATA,DISP=SHR
191.  //FT04F001 DD DSN=MBLICEN.ICENODEL.&CYSC&CY..STUPOP.DATA,
192.  //    DISP=(,CATLG,DELETE),UNIT=DISK,
193.  //    SPACE=(TRK,(30,5),RLSE),
194.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
195.  //FT06F001 DD SYSOUT=A
196.  //FT08F001 DD DSN=MBLICEN.ICENODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
197.  //FT09F001 DD DSN=MBLICEN.ICENODEL.&CYSC..BLRPOP.DATA,DISP=OLD
198.  //FT10F001 DD DSN=MBLICEN.ICENODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
199.  //FT11F001 DD DSN=MBLICEN.ICENODEL.FIXED.AGCRCDF.DATA,DISP=SHR
200.  //FT12F001 DD DSN=MBLICEN.ICENODEL.FIXED.MEMBIPS2.DATA,DISP=SHR
201.  //FT13F001 DD DSN=MBLICEN.ICENODEL.FIXED.RYEARACY..DATA,DISP=SHR
202.  //FT16F001 DD DSN=MBLICEN.ICENODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
203.  //FT17F001 DD DSN=MBLICEN.ICENODEL.&PFRSC&PY..NUNCOL.DATA,DISP=SHR
204.  //    PEND
205.  //STEP01 EXEC CREATE6,
206.  //    CY=00,PY=95,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE87,
207.  //    BG=EEANID,BN=CRNTSIP
208.  //MBLIC608 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
209.  /*CPUID EPA3
210.  /*ROUTE PRINT M3
211.  /*AFTER   MBLIC607
212.  //FLCN6 PROC
213.  //    EXEC PGM=FLCN6,REGION=1500K
214.  //STEPLIB DD DSN=MBLICEN.ICENODEL.LOADLIB.OBJ,DISP=SHR
215.  //FT01F001 DD DSN=MBLICEN.ICENODEL.&DS..DEMSCEN.DATA,DISP=SHR
216.  //FT02F001 DD DSN=MBLICEN.ICENODEL.&CYSC..ESIN.DATA,DISP=MOD
217.  //FT03F001 DD DSN=MBLICEN.ICENODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
218.  //FT06F001 DD SYSOUT=A
219.  //FT08F001 DD DSN=MBLICEN.ICENODEL.&CYSC&CY..BTURTC.DATA,
220.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
221.  //    SPACE=(TRK,(5,5),RLSE),
222.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
223.  //FT09F001 DD DSN=MBLICEN.ICENODEL.FIXED.RYEARACY..DATA,DISP=SHR
224.  //FT10F001 DD DSN=MBLICEN.ICENODEL.FIXED.RETRCOST.DATA,DISP=SHR
225.  //FT11F001 DD DSN=MBLICEN.ICENODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
226.  //FT13F001 DD DSN=MBLICEN.ICENODEL.&PFRSC&PY..NUNCOL.DATA,DISP=SHR
227.  //FT14F001 DD DSN=MBLICEN.ICENODEL.&CYSC&CY..BLRAFC4.DATA,
228.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
229.  //    SPACE=(TRK,(250,25),RLSE),
230.  //    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
231.  //FT15F001 DD DSN=MBLICEN.ICENODEL.&ARO..HSPSREGS.DATA,DISP=SHR
232.  //FT16F001 DD DSN=MBLICEN.ICENODEL.&CYSC&CY..NUNCOL.DATA,
233.  //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
234.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
235.  //        PEND
236.  //B EXEC FLCN6,
237.  //    CY=00,PY=95,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE87,
238.  //    BG=EEANID,ARO=BASE87,FO=Y
```

TABLE 21. COMPOSITE JCL

```
239.  //MSLIC609 JOB (ACCOUNT ID,BIN NO),TIME=(1,30)
240.  /*CPUID EPA3
241.  /*ROUTE PRINT M3
242.  /*AFTER   MSLIC608
243.  //CREATE6 PROC
244.  //    EXEC PGM=CREATE6,REGION=1000K
245.  //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
246.  //FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
247.  //FT02F001 DD DSN=MSLICEN.ICEMODEL.&SN..SIPMOD.DATA,DISP=SHR
248.  //FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
249.  //FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
250.  //    DISP=(,CATLG,DELETE),UNIT=DISK,
251.  //    SPACE=(TRK,(30,5),RLSE),
252.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
253.  //FT06F001 DD SYSOUT=A
254.  //FT08F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
255.  //FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,DISP=OLD
256.  //FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUD1S.DATA,DISP=SHR
257.  //FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AGCRCDF.DATA,DISP=SHR
258.  //FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.MEMSIP82.DATA,DISP=SHR
259.  //FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
260.  //FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
261.  //FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
262.  //    PEND
263.  //STEP01 EXEC CREATE6,
264.  //    CY=10,PY=00,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE87,
265.  //    DS=EEAMID,SN=CRNTSIP
266.  //MSLIC610 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
267.  /*CPUID EPA3
268.  /*ROUTE PRINT M3
269.  /*AFTER   MSLIC609
270.  //FLCH6 PROC
271.  //    EXEC PGM=FLCH6,REGION=1500K
272.  //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
273.  //FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
274.  //FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,DISP=MOD
275.  //FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
276.  //FT06F001 DD SYSOUT=A
277.  //FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
278.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
279.  //    SPACE=(TRK,(5,5),RLSE),
280.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
281.  //FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
282.  //FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
283.  //FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
284.  //FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
285.  //FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
286.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
287.  //    SPACE=(TRK,(250,25),RLSE),
288.  //    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
289.  //FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..NSPSREGS.DATA,DISP=SHR
290.  //FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..NUMCOL.DATA,
291.  //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
292.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
293.  //        PEND
294.  //B EXEC FLCH6,
295.  //    CY=10,PY=00,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE87,
296.  //    DS=EEAMID,ARO=BASE87,FO=Y
```

TABLE 21. COMPOSITE JCL

```
297.  //MSLIC611 JOB (ACCOUNT ID,BIN NO),TIME=(1,30)
298.  /*CPUID EPA3
299.  /*ROUTE PRINT K3
300.  /*AFTER   MSLIC610
301.  //CREATE6 PROC
302.  //    EXEC PGM=CREATE6,REGION=1000K
303.  //STEPLIB DD DSN=MSLICEN.ICENODEL.LOADLIB.OBJ,DISP=SHR
304.  //FT01F001 DD DSN=MSLICEN.ICENODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
305.  //FT02F001 DD DSN=MSLICEN.ICENODEL.&SN..SIPMOD.DATA,DISP=SHR
306.  //FT03F001 DD DSN=MSLICEN.ICENODEL.&DS..DEMSCEN.DATA,DISP=SHR
307.  //FT04F001 DD DSN=MSLICEN.ICENODEL.&CYSC&CY..BTUPOP.DATA,
308.  //    DISP=(,CATLG,DELETE),UNIT=DISK,
309.  //    SPACE=(TRK,(30,5),RLSE),
310.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
311.  //FT06F001 DD SYSOUT=A
312.  //FT08F001 DD DSN=MSLICEN.ICENODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
313.  //FT09F001 DD DSN=MSLICEN.ICENODEL.&CYSC..BLRPOP.DATA,DISP=OLD
314.  //FT10F001 DD DSN=MSLICEN.ICENODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
315.  //FT11F001 DD DSN=MSLICEN.ICENODEL.FIXED.AGCRCDF.DATA,DISP=SHR
316.  //FT12F001 DD DSN=MSLICEN.ICENODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
317.  //FT13F001 DD DSN=MSLICEN.ICENODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
318.  //FT16F001 DD DSN=MSLICEN.ICENODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
319.  //FT17F001 DD DSN=MSLICEN.ICENODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
320.  //FT18F001 DD DSN=MSLICEN.ICENODEL.&CYSC.85.BTUPOP.DATA,DISP=SHR
321.  //    PEND
322.  //STEP01 EXEC CREATE6,
323.  //    CY=20,PY=10,CYSC=BASES7,PCRSC=BASES7,PFRSC=BASES7,
324.  //    DS=EEAMID,SN=CRNTSIP
325.  //MSLIC612 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
326.  /*CPUID EPA3
327.  /*ROUTE PRINT K3
328.  /*AFTER   MSLIC611
329.  //FLCN6 PROC
330.  //    EXEC PGM=FLCN6,REGION=1500K
331.  //STEPLIB DD DSN=MSLICEN.ICENODEL.LOADLIB.OBJ,DISP=SHR
332.  //FT01F001 DD DSN=MSLICEN.ICENODEL.&DS..DEMSCEN.DATA,DISP=SHR
333.  //FT02F001 DD DSN=MSLICEN.ICENODEL.&CYSC..ESIN.DATA,DISP=MOD
334.  //FT05F001 DD DSN=MSLICEN.ICENODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
335.  //FT06F001 DD SYSOUT=A
336.  //FT08F001 DD DSN=MSLICEN.ICENODEL.&CYSC&CY..BTURTC.DATA,
337.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
338.  //    SPACE=(TRK,(5,5),RLSE),
339.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
340.  //FT09F001 DD DSN=MSLICEN.ICENODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
341.  //FT10F001 DD DSN=MSLICEN.ICENODEL.FIXED.RETRCOST.DATA,DISP=SHR
342.  //FT11F001 DD DSN=MSLICEN.ICENODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
343.  //FT13F001 DD DSN=MSLICEN.ICENODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
344.  //FT14F001 DD DSN=MSLICEN.ICENODEL.&CYSC&CY..BLRAFC4.DATA,
345.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
346.  //    SPACE=(TRK,(250,25),RLSE),
347.  //    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
348.  //FT15F001 DD DSN=MSLICEN.ICENODEL.&ARO..MSPBREGS.DATA,DISP=SHR
349.  //FT16F001 DD DSN=MSLICEN.ICENODEL.&CYSC&CY..NUMCOL.DATA,
350.  //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
351.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
352.  //        PEND
353.  //B EXEC FLCN6,
354.  //    CY=20,PY=10,CYSC=BASES7,PCRSC=BASES7,PFRSC=BASES7,
355.  //    DS=EEAMID,ARO=BASES7,FO=Y
```

TABLE 21. COMPOSITE JCL

```
//MSLIC613 JOB (ACCOUNT ID,BIN NO),TIME=(1,30)
/*CPUID EPA3
/*ROUTE PRINT M3
/*AFTER   MSLIC612
//CREATE6 PROC
//   EXEC PGM=CREATE6,REGION=1000K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&SN..SIPMOD.DATA,DISP=SHR
//FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
//   DISP=(,C^TLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(30,5),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT06F001 DD SYSOUT=A
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
//FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,DISP=OLD
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AGCRCDF.DATA,DISP=SHR
//FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.NEWSIP&2.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
//FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
//FT18F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.85.BTUPOP.DATA,DISP=SHR
//FT19F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.90.BTUPOP.DATA,DISP=SHR
//FT20F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.95.BTUPOP.DATA,DISP=SHR
//   PEND
//STEP01 EXEC CREATE6,
//   CY=30,PY=20,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE87,
//   DS=EEAMID,SN=CRNTSIP
//MSLIC614 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
/*CPUID EPA3
/*ROUTE PRINT M3
/*AFTER   MSLIC613
//FLCN6 PROC
//   EXEC PGM=FLCN6,REGION=1500K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,DISP=MOD
//FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
//FT06F001 DD SYSOUT=A
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
//   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(5,5),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
//FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
//   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(250,25),RLSE),
//   DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
//FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..HSPSREGS.DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..NUMCOL.DATA,
//   DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//      PEND
//B EXEC FLCN6,
//   CY=30,PY=20,CYSC=BASE87,PCRSC=BASE87,PFRSC=BASE87,
//   DS=EEAMID,ARO=BASE87,FO=Y
```

TABLE 21. COMPOSITE JCL

```
417.    //MSLIC615 JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
418.    /*CPUID EPA3
419.    /*ROUTE PRINT MS
420.    /*AFTER   MSLIC614
421.    //TABLE6 PROC
422.    //       EXEC PGM=TABLE6,REGION=1500K
423.    //STEPLIB DD DSN=MSLICEN.ICENMODEL.LOADLIB.OBJ,DISP=SHR
425.    //FT10F001 DD DSN=MSLICEN.ICENMODEL.BASEB0.BLRAFC4.DATA,DISP=SHR
426.    //FT11F001 DD DSN=MSLICEN.ICENMODEL.&CYSC.85.BLRAFC4.DATA,DISP=SHR
427.    //FT12F001 DD DSN=MSLICEN.ICENMODEL.&CYSC.90.BLRAFC4.DATA,DISP=SHR
428.    //FT13F001 DD DSN=MSLICEN.ICENMODEL.&CYSC.95.BLRAFC4.DATA,DISP=SHR
429.    //FT14F001 DD DSN=MSLICEN.ICENMODEL.&CYSC.00.BLRAFC4.DATA,DISP=SHR
430.    //FT15F001 DD DSN=MSLICEN.ICENMODEL.&CYSC.10.BLRAFC4.DATA,DISP=SHR
431.    //FT16F001 DD DSN=MSLICEN.ICENMODEL.&CYSC.20.BLRAFC4.DATA,DISP=SHR
432.    //FT17F001 DD DSN=MSLICEN.ICENMODEL.&CYSC.30.BLRAFC4.DATA,DISP=SHR
433.    //FT18F001 DD DSN=MSLICEN.ICENMODEL.&CYSC..ESIN.DATA,DISP=SHR
434.    //FT06F001 DD SYSOUT=A
435.    //       PEND
436.    // EXEC TABLE6,
437.    //  CYSC=BASEB7
438.    //FT05F001  DD *
439.    2030
440.    BASE CASE
```

TABLE 22. TABLE6 JCL

```
1.    //MSLTABLE JOB (ACCOUNT ID,BIN NO,,200),TIME=(1,30)
2.    /*CPUID EPA3
3.    /*ROUTE PRINT N3
4.    //TABLE6 PROC
5.    //       EXEC PGM=TABLE6,REGION=1500K
6.    //STEPLIB DD DSN=MSLICEM.ICEMODEL.LOADLIB.OBJ,DISP=SHR
7.    //FT10F001 DD DSN=MSLICEM.ICEMODEL.BASE80.BLRAFC4.DATA,DISP=SHR
8.    //FT11F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.85.BLRAFC4.DATA,DISP=SHR
9.    //FT12F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.90.BLRAFC4.DATA,DISP=SHR
10.   //FT13F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.95.BLRAFC4.DATA,DISP=SHR
11.   //FT14F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.00.BLRAFC4.DATA,DISP=SHR
12.   //FT15F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.10.BLRAFC4.DATA,DISP=SHR
13.   //FT16F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.20.BLRAFC4.DATA,DISP=SHR
14.   //FT17F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.30.BLRAFC4.DATA,DISP=SHR
15.   //FT18F001 DD DSN=MSLICEM.ICEMODEL.&CYSC..ESIM.DATA,DISP=SHR
16.   //FT06F001 DD SYSOUT=A
17.   //       PEND
18.   // EXEC TABLE6,
19.   //  CYSC=BASE87
20.   //FT05F001  DD *
21.   2030
22.   BASE CASE
```

to 40 characters, including blank spaces in front of the title for centering) which will be printed at the top of every output table. Leave line 22 blank if you wish to suppress this option.

The output tables present aggregate ICE Model projections for industrial fossil fuel-fired boilers by year (1980 base year, 1985, 1990, 1995, 2000, 2010, 2020, and 2030), including:

- SO_2 emissions by State
- NO_x emissions by State
- Sulfate emissions by State
- Particulate matter emissions by State
- Total annualized costs by State (the sum of new and retrofit boiler and pollution control equipment annualized capital costs,* annual non-fuel O&M costs, and fuel costs in the output year)
- Fuel demand by fuel type and State for all boilers
- Fuel demand for new industrial boilers by fuel type and State
- National fuel demand for new industrial boilers by size (eight categories), annual capacity utilization rate (five categories), and fuel type
- National number of new industrial boilers by size class (3 aggregate groups), previous coal experience (with or without), and fuel type.

After the TABLE6 program output has been printed, all ICE Model-created files (those with a second qualifier equivalent to the value of CYSC) can be deleted. The exception may be:

- ICEMODEL._ _ _ _ _ _.ESIM.DATA

This file may be retained as an ESIM input file.**

---

*Capital costs x 0.13147, a capital recovery factor based on ten percent interest rate and a 15-year period.

**The dataset naming conventions are described in Appendix A.

SECTION 4
OPERATING INSTRUCTIONS: TSO

INTRODUCTION

The ICE Model can be run for 1985, 1990, 1995, 2000, 2010, 2020, and 2030 (referred to as run years or as model years). These years must be run in sequence. The current base year in the ICE Model Version 6.0 is 1980.

Two jobs must be run for each model year. The first job (referred to as a "creation" run) projects the characteristics of industrial fossil fuel-fired boilers (e.g., new/existing, size, location, local air emission regulations). The second job (referred to as a fuel choice run) makes "fuel choice" decisions and determines air emission rates and costs for each group of boilers in the population.

Figure 3 presents the sequence of ICE Model jobs. Fifteen jobs are required to run all seven model years and print the standard output tables. They must be run in the following sequence:

- CREATE6 for 1985
- FLCH6 for 1985
- CREATE6 for 1990
- FLCH6 for 1990
- CREATE6 for 1995
- FLCH6 for 1995
- CREATE6 for 2000
- FLCH6 for 2000
- CREATE6 for 2010
- FLCH6 for 2010
- CREATE6 for 2020
- FLCH6 for 2020
- CREATE6 for 2030
- FLCH6 for 2030
- TABLE6

CREATION RUN

The JCL needed to make a creation run is stored in file ICEMODEL.VERSION6.CREATE6.CNTL (see Table 23). This is set up as an in-stream procedure. Datasets whose names can vary between creation runs are specified with symbolic parameters in lines 28 and 29. The remaining datasets have their full names specified explicitly since they will not vary between runs.

Lines 1 and 2 are system- and user-specific and will need to be modified by each user. Lines 28 and 29 must be edited and then the job can be submitted. Table 14 presents a list of the symbolic parameters described below.

- CY: Current run year -- "85" must be run before "90", etc.
- PY: Previous run year -- every creation run needs to access data from the previous run year. The value for PY is a function of the value for CY.
  - if CY=85, PY=80
  - if CY=90, PY=85
  - if CY=95, PY=90
  - if CY=00, PY=95
  - if CY=10, PY=00
  - if CY=20, PY=10
  - if CY=30, PY=20
- CYSC: Current years scenario code. User-specified with 1-6 characters. Helps to differentiate one set of runs from another. For example, CYSC=HPLGBC could represent high fuel price, low economic growth, base case environmental regulations. Another example is CYSC=RUN32. This scenario code is included in the name of ICE Model output files.
- PCRSC: What is the scenario code for the previous run year? If CY=85, PCRSC=BASE. This is true without exception. If CY=90, 95, 00, 10, 20, or 30, the PCRSC can be set to any scenario code (but is usually set to the value of CYSC). The value of PCRSC determines which set of output files from previous runs will be input files for the current run.
- PFRSC: What is the scenario code for the previous fuel choice run? If CY=85, PFRSC=BASE. This is true without exceptions. If CY=90, 95, 00, 10, 20, or 30, then PFRSC can be set to any scenario code (as discussed

TABLE 23. CREATE6 JCL

```
1.    //MSLCR6 JOB (ACCOUNT ID,BIN NO),'CREATE',TIME=(,30),MSGCLASS=P
2.    /*CPUID EPA3
3.    /*ROUTE PRINT HOLD
4.    //CREATE6 PROC
5.    //    EXEC PGM=CREATE6,REGION=1000K
6.    //STEPLIB DD DSN=MSLICEM.ICEMODEL.LOADLIB.OBJ,DISP=SHR
7.    //FT01F001 DD DSN=MSLICEM.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
8.    //FT02F001 DD DSN=MSLICEM.ICEMODEL.&SM..SIPMOD.DATA,DISP=SHR
9.    //FT03F001 DD DSN=MSLICEM.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
10.   //FT04F001 DD DSN=MSLICEM.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
11.   //    DISP=(,CATLG,DELETE),UNIT=DISK,
12.   //    SPACE=(TRK,(30,5),RLSE),
13.   //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
14.   //FT06F001 DD SYSOUT=P
15.   //FT08F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..BLRAFC4.DATA,DISP=SHR
16.   //FT09F001 DD DSN=MSLICEM.ICEMODEL.&CYSC..BLRPOP.DATA,
17.   //    DISP=(,CATLG,DELETE),UNIT=DISK,
18.   //    SPACE=(TRK,(250,20),RLSE),
19.   //    DCB=(DSORG=PS,RECFM=FB,LRECL=158,BLKSIZE=15800)
20.   //FT10F001 DD DSN=MSLICEM.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
21.   //FT11F001 DD DSN=MSLICEM.ICEMODEL.FIXED.AQCRCDF.DATA,DISP=SHR
22.   //FT12F001 DD DSN=MSLICEM.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
23.   //FT13F001 DD DSN=MSLICEM.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
24.   //FT16F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
25.   //FT17F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
26.   //    PEND
27.   //STEP01 EXEC CREATE6,
28.   //    CY=85,PY=80,CYSC=LSR,PCRSC=BASE,PFRSC=BASE,
29.   //    DS=EEAMID,SM=CRNTSIP
```

above for PCRSC). The value of PFRSC determines which set of output files on the disk from previous runs will be input files for the current job.

The parameters listed above are used in the labels of ICE Model output files. Two other parameters are used to specify ICE Model input files created by the model user. ICE Model input files are explained in Section 2.

- DS: Demand scenario. Every creation run needs a forecast of total industrial fossil fuel demand in industrial boilers by State and industry group.
- SM: SIP modifications. An ICE Model user option is the capability to override local SO_2 emissions regulations for existing industrial boilers with a Federal nationwide SO_2 emissions standard

Table 23 presents an example setup for a 1985 creation run (note in line 28 that "CY=85", "PY=80", "PCRSC=BASE", and "PFRSC=BASE"). CYSC=LSR, in line 28, should be replaced by a user-created current year scenario code. In line 29, "SM=CRNTSIP" indicates (from Table 3) that current SIPs are applicable (and are not replaced by a Federal SO_2 emission standard) for existing industrial residual fuel oil and coal boilers. In line 29, "DS=EEAMID" should be replaced by the proper user-created file name (see Section 2).

FUEL CHOICE RUN

File ICEMODEL.VERSION6.FLCH6.CNTL contains the necessary JCL for a fuel choice run (see Table 24). Lines 1 and 2 are system- or user-specific and will need to be modified by each user. This is also set up as an in-stream procedure. The symbolic parameters in lines 33 and 34 must be edited and then the job can be submitted.

Table 16 presents a list of these parameters.

- PCRSC: This time, this parameter refers to a file created by the last creation run for the current run year. Set PCRSC equal to the same value as CYSC in the last creation run.
- ARO: This refers to a user-created ICE Model input file of NSPS assumptions (see Section 2). This file does not necessarily have to remain the same for all run years.*

---

* It is recommended that the file presented in Table 2 be used when CY=85.

TABLE 24. FLCH6 JCL

```
1.  //MSLFLCH6 JOB (ACCOUNT ID,BIN NO,,200),'FLCH6',TIME=(1,30),MSGCLASS=P
2.  /*CPUID EPA3
3.  /*ROUTE PRINT HOLD
4.  //FLCH6 PROC
5.  //    EXEC PGM=FLCH6,REGION=1500K
6.  //STEPLIB DD DSN=MSLICEM.ICEMODEL.LOADLIB.OBJ,DISP=SHR
7.  //FT01F001 DD DSN=MSLICEM.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
8.  //FT02F001 DD DSN=MSLICEM.ICEMODEL.&CYSC..ESIM.DATA,
9.  //    DISP=(,CATLG,DELETE),UNIT=DISK,
10. //    SPACE=(TRK,(10,10),RLSE),
11. //    DCB=(DSORG=PS,LRECL=100,BLKSIZE=10000,RECFM=FB)
12. //FT04F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..ESIM.DATA,DISP=SHR
13. //FT05F001 DD DSN=MSLICEM.ICEMODEL.FIXED.FCOPT&PO..DATA,DISP=SHR
14. //FT06F001 DD SYSOUT=P
15. //FT08F001 DD DSN=MSLICEM.ICEMODEL.&CYSC&CY..BTURTC.DATA,
16. //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
17. //    SPACE=(TRK,(5,5),RLSE),
18. //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
19. //FT09F001 DD DSN=MSLICEM.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
20. //FT10F001 DD DSN=MSLICEM.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
21. //FT11F001 DD DSN=MSLICEM.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
22. //FT13F001 DD DSN=MSLICEM.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
23. //FT14F001 DD DSN=MSLICEM.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
24. //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
25. //    SPACE=(TRK,(250,25),RLSE),
26. //    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
27. //FT15F001 DD DSN=MSLICEM.ICEMODEL.&ARO..NSPSREGS.DATA,DISP=SHR
28. //FT16F001 DD DSN=MSLICEM.ICEMODEL.&CYSC&CY..NUMCOL.DATA,
29. //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
30. //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
31. //        PEND
32. //B EXEC FLCH6,
33. //    CY=85,PY=80,CYSC=LSR,PCRSC=LSR,PFRSC=BASE,
34. //    DS=EEAMID,ARO=CURRENT,FO=Y
```

- FO: Fuel choice decision criteria option. If "FO-Y", the fuel choice decision criterion for new industrial boilers is based on an analysis of recent industrial boiler sales data and is a function of expected cost differences, previous coal experience, region, and boiler firing rate (size). This is the standard operating procedure. If "FO-N", the fuel choice decision criteria for new industrial boilers is based on the lowest cost (total after-tax capital, O&M and fuel) alternative.

Every execution of FLCH6 creates an output file which contains aggregate forecasts of emissions and costs by State. This ICE Model output file is an input file for EPA's Emissions Strategy Integration Model (ESIM). ESIM was developed for EPA by E.H. Pechan and Associates, Inc. This ICE Model output file is labeled ICEMODEL._ _ _ _ _ _.ESIM.DATA where the blanks contain the current year scenario code (value for CYSC).

The file format was specified by Phil Childress (E.H. Pechan and Associates, Inc.) in a memorandum dated April 23, 1984. See Tables 17-19. The ICE Model does not fill in values for columns 1, 9, 10, and 11 (see Table 17). These columns should be edited by the user before this data file is read by ESIM. The source sector code in this file (column 8 in Table 17) is always "B" (see Table 18). VOC emissions projections are not an ICE Model output feature. The ICE Model does project SO_2, SO_4, and NO_x emissions (see Table 19).

Table 24 presents an example set-up for a 1985 fuel choice run (note in line 33 that "CY-85", "PY-80", and "PFRSC-BASE"). The values for CYSC and DS in Table 24 are the same as the values for CYSC and DS in Table 23. The ARO file name shown in line 34 in Table 24 is recommended for all 1985 fuel choice runs (see Table 2). Note also in line 34 that "FO-Y", the standard ICE Model operating procedure.

RUNNING ALL YEARS

Usually, the user will want to run all seven model years. This can be accomplished as follows:

1) Edit the JCL file for a 1985 creation run to assign proper parameter values
2) Submit the JCL

3) Wait for job to finish executing
4) Edit the JCL for a 1985 fuel choice run
5) Submit the JCL
6) Wait for job to finish executing
7) Repeat steps 1-6 for 1990, 1995, 2000, 2010, 2020, and 2030
8) Submit the output table JCL

Table 20 summarizes all of the ICE Model user options. In general, the same demand scenario (DS) file and current year scenario code (CYSC) will be used in all 15 jobs.

Alternatively, the user may edit one JCL file which will submit the necessary 15 jobs in the proper order. The file with this JCL is ICEMODEL.VERSION6.ALLYEARS.CNTL (see Table 25). It consists simply of the in-stream procedures for each of the 15 jobs (as described in the previous sections) concatenated to each other in the proper order (i.e., 1985 creation, followed by 1985 fuel choice, followed by 1990 creation, etc.). Although the symbolic parameters for each of the 15 jobs must still be set to their proper values by the user,* this "all-years" file speeds the process considerably. When the values are set, a single run command will submit all 15 jobs in the correct sequence. The first two lines in each step of the JCL are system- or user-specific and will need to be modified before use.

OUTPUT TABLES

After running the ICE Model for all seven model years and using the same value for parameter CYSC in each year, the user may produce output tables summarizing the results. The JCL to do this is also set up as an in-stream procedure, and is found in ICEMODEL.VERSION6.TABLE6.CNTL (see Table 26). The first two lines in this JCL are system- or user-specific and will need to be modified by the user. The only symbolic parameter used is CYSC (line 19). It should be given the value which was used for CYSC in each of the 14 jobs making up the seven-year (1985, 1990, 1995, 2000, 2010, 2020, and 2030) ICE Model run the user wishes to summarize. A scenario title may be included in line 22 (up

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* The following parameters do not need to be changed from the values currently given them in this file: 1) CY and PY in all jobs, 2) PCRSC and PFRSC in the 1985 creation run, and 3) PFRSC in the 1985 fuel choice run.

TABLE 25. COMPOSITE JCL

```
1.  //MSLIC601 JOB (ACCOUNT ID,BIN NO),'ALLYEARS',TIME=(,30),MSGCLASS=P
2.  /*CPUID EPA3
3.  /*ROUTE PRINT HOLD
4.  //CREATE6 PROC
5.  //    EXEC PGM=CREATE6,REGION=1000K
6.  //STEPLIB DD DSN=MSLICEN.ICENODEL.LOADLIB.OBJ,DISP=SHR
7.  //FT01F001 DD DSN=MSLICEN.ICENODEL.&PCRSC&PY..STUPOP.DATA,DISP=SHR
8.  //FT02F001 DD DSN=MSLICEN.ICENODEL.&BN..SIPWOD.DATA,DISP=SHR
9.  //FT03F001 DD DSN=MSLICEN.ICENODEL.&DS..DEMSCEN.DATA,DISP=SHR
10. //FT04F001 DD DSN=MSLICEN.ICENODEL.&CYSC&CY..STUPOP.DATA,
11. //    DISP=(,CATLG,DELETE),UNIT=DISK,
12. //    SPACE=(TRK,(30,5),RLSE),
13. //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
14. //FT06F001 DD SYSOUT=P
15. //FT08F001 DD DSN=MSLICEN.ICENODEL.&PFRSC&PY..BLRAFC4.DATA,DISP=SHR
16. //FT09F001 DD DSN=MSLICEN.ICENODEL.&CYSC..BLRPOP.DATA,
17. //    DISP=(,CATLG,DELETE),UNIT=DISK,
18. //    SPACE=(TRK,(250,20),RLSE),
19. //    DCB=(DSORG=PS,RECFM=FB,LRECL=158,BLKSIZE=15800)
20. //FT10F001 DD DSN=MSLICEN.ICENODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
21. //FT11F001 DD DSN=MSLICEN.ICENODEL.FIXED.AGCRCDF.DATA,DISP=SHR
22. //FT12F001 DD DSN=MSLICEN.ICENODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
23. //FT13F001 DD DSN=MSLICEN.ICENODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
24. //FT16F001 DD DSN=MSLICEN.ICENODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
25. //FT17F001 DD DSN=MSLICEN.ICENODEL.&PFRSC&PY..HUNCOL.DATA,DISP=SHR
26. //    PEND
27. //STEP01 EXEC CREATE6,
28. //    CY=85,PY=80,CYSC=LSR,PCRSC=BASE,PFRSC=BASE,
29. //    DS=EEAMID,BN=CRNTSIP
30. //MSLIC602 JOB (ACCOUNT ID,BIN NO,,200),'STEP02',TIME=(1,30),MSGCLASS=P
31. /*CPUID EPA3
32. /*ROUTE PRINT HOLD
33. /*AFTER   MSLIC601
34. //FLCN6 PROC
35. //    EXEC PGM=FLCN6,REGION=1500K
36. //STEPLIB DD DSN=MSLICEN.ICENODEL.LOADLIB.OBJ,DISP=SHR
37. //FT01F001 DD DSN=MSLICEN.ICENODEL.&DS..DEMSCEN.DATA,DISP=SHR
38. //FT02F001 DD DSN=MSLICEN.ICENODEL.&CYSC..ESIN.DATA,
39. //    DISP=(,CATLG,DELETE),UNIT=DISK,
40. //    SPACE=(TRK,(10,10),RLSE),
41. //    DCB=(DSORG=PS,LRECL=100,BLKSIZE=10000,RECFM=FB)
42. //FT04F001 DD DSN=MSLICEN.ICENODEL.&PFRSC&PY..ESIN.DATA,DISP=SHR
43. //FT05F001 DD DSN=MSLICEN.ICENODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
44. //FT06F001 DD SYSOUT=P
45. //FT08F001 DD DSN=MSLICEN.ICENODEL.&CYSC&CY..BTURTC.DATA,
46. //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
47. //    SPACE=(TRK,(5,5),RLSE),
48. //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
49. //FT09F001 DD DSN=MSLICEN.ICENODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
50. //FT10F001 DD DSN=MSLICEN.ICENODEL.FIXED.RETRCOST.DATA,DISP=SHR
51. //FT11F001 DD DSN=MSLICEN.ICENODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
52. //FT13F001 DD DSN=MSLICEN.ICENODEL.&PFRSC&PY..HUNCOL.DATA,DISP=SHR
53. //FT14F001 DD DSN=MSLICEN.ICENODEL.&CYSC&CY..BLRAFC4.DATA,
54. //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
55. //    SPACE=(TRK,(250,25),RLSE),
56. //    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
57. //FT15F001 DD DSN=MSLICEN.ICENODEL.&ARO..HSPSREGS.DATA,DISP=SHR
58. //FT16F001 DD DSN=MSLICEN.ICENODEL.&CYSC&CY..HUNCOL.DATA,
59. //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
60. //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
61. //        PEND
62. //B EXEC FLCN6,
63. //    CY=85,PY=80,CYSC=LSR,PCRSC=LSR,PFRSC=BASE,
64. //    DS=EEAMID,ARO=CURRENT,FO=Y
```

TABLE 25. COMPOSITE JCL

```
//MSLIC603 JOB (ACCOUNT ID,BIN NO),'STEP03',TIME=(1,30),MSGCLASS=P
/*CPUID EPA3
/*ROUTE PRINT HOLD
/*AFTER   MSLIC602
//CREATE6 PROC
//   EXEC PGM=CREATE6,REGION=1000K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&SN..SIPMOD.DATA,DISP=SHR
//FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
//   DISP=(,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(30,5),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT06F001 DD SYSOUT=P
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
//FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,DISP=OLD
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AOCRCDF.DATA,DISP=SHR
//FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
//FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
//   PEND
//STEP01 EXEC CREATE6,
//   CY=90,PY=85,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
//   DS=EEAMID,SN=CRNTSIP
//MSLIC604 JOB (ACCOUNT ID,BIN NO,,200),'STEP04',TIME=(1,30),MSGCLASS=P
/*CPUID EPA3
/*ROUTE PRINT HOLD
/*AFTER   MSLIC603
//FLCN6 PROC
//   EXEC PGM=FLCN6,REGION=1500K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIM.DATA,DISP=MOD
//FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
//FT06F001 DD SYSOUT=P
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
//   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(5,5),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
//FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
//   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(250,25),RLSE),
//   DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
//FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..NSPSREGS.DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..NUMCOL.DATA,
//   DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//      PEND
//B EXEC FLCN6,
//   CY=90,PY=85,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
//   DS=EEAMID,ARO=BASE87,FO=Y
```

TABLE 25. COMPOSITE JCL

```
125.    //MSLIC605 JOB (ACCOUNT ID,BIN NO),'STEP05',TIME=(1,30),MSGCLASS=P
124.    /*CPUID EPA3
125.    /*ROUTE PRINT HOLD
126.    /*AFTER   MSLIC604
127.    //CREATE6 PROC
128.    //   EXEC PGM=CREATE6,REGION=1000K
129.    //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
130.    //FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
131.    //FT02F001 DD DSN=MSLICEN.ICEMODEL.&SH..SIPMOD.DATA,DISP=SHR
132.    //FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
133.    //FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
134.    //   DISP=(,CATLG,DELETE),UNIT=DISK,
135.    //   SPACE=(TRK,(30,5),RLSE),
136.    /'   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
137.    //FT06F001 DD SYSOUT=P
138.    //FT08F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
139.    //FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,DISP=OLD
140.    //FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
141.    //FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AGCRCDF.DATA,DISP=SHR
142.    //FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
143.    //FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
144.    //FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
145.    //FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
146.    //   PEND
147.    //STEP01 EXEC CREATE6,
148.    //   CY=95,PY=90,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
149.    //   DS=EEAMID,SH=LSR
150.    //MSLIC606 JOB (ACCOUNT ID,BIN NO,,200),'STEP06',TIME=(1,30),MSGCLASS=P
151.    /*CPUID EPA3
152.    /*ROUTE PRINT HOLD
153.    /*AFTER   MSLIC605
154.    //FLCN6 PROC
155.    //'  EXEC PGM=FLCN6,REGION=1500K
156.    //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
157.    //FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
158.    //FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,DISP=MOD
159.    //FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
160.    //FT06F001 DD SYSOUT=P
161.    //FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
162.    //   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
163.    //   SPACE=(TRK,(5,5),RLSE),
164.    //   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
165.    //FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
166.    //FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
167.    //FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
168.    //FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
169.    //FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
170.    //   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
171.    //   SPACE=(TRK,(250,25),RLSE),
172.    //   DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
173.    //FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..MSPSREGS.DATA,DISP=SHR
174.    //FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..NUMCOL.DATA,
175.    //   DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
176.    //   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
177.    //      PEND
178.    //B EXEC FLCN6,
179.    //   CY=95,PY=90,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
180.    //   DS=EEAMID,ARO=BASE87,PO=Y
```

TABLE 25. COMPOSITE JCL

```
//MSLIC607 JOB (ACCOUNT ID,BIN NO),'STEP07',TIME=(1,30),MSGCLASS=P
/*CPUID EPA3
/*ROUTE PRINT HOLD
/*AFTER   MSLIC606
//CREATE6 PROC
//    EXEC PGM=CREATE6,REGION=1000K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&SN..SIPMOD.DATA,DISP=SHR
//FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
//    DISP=(,CATLG,DELETE),UNIT=DISK,
//    SPACE=(TRK,(30,5),RLSE),
//    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT06F001 DD SYSOUT=P
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
//FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,DISP=OLD
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AQCRCDF.DATA,DISP=SHR
//FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
//FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..HUMCOL.DATA,DISP=SHR
//    PEND
//STEP01 EXEC CREATE6,
//    CY=00,PY=95,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
//    DS=EEAMID,SN=LSR
//MSLIC608 JOB (ACCOUNT ID,BIN NO,,200),'STEP08',TIME=(1,30),MSGCLASS=P
/*CPUID EPA3
/*ROUTE PRINT HOLD
/*AFTER   MSLIC607
//FLCN6 PROC
//    EXEC PGM=FLCN6,REGION=1500K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,DISP=MOD
//FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
//FT06F001 DD SYSOUT=P
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
//    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//    SPACE=(TRK,(5,5),RLSE),
//    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..HUMCOL.DATA,DISP=SHR
//FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
//    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//    SPACE=(TRK,(250,25),RLSE),
//    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
//FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..NSPSREGS.DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..HUMCOL.DATA,
//    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
//    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//        PEND
//S EXEC FLCN6,
//    CY=00,PY=95,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
//    DS=EEAMID,ARO=BASE87,FO=Y
```

TABLE 25. COMPOSITE JCL

```
239.  //MSLIC609 JOB (ACCOUNT ID,BIN NO),'STEP09',TIME=(1,30),MSGCLASS=P
240.  /*CPUID EPA3
241.  /*ROUTE PRINT HOLD
242.  /*AFTER   MSLIC608
243.  //CREATE6 PROC
244.  //    EXEC PGM=CREATE6,REGION=1000K
245.  //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
246.  //FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
247.  //FT02F001 DD DSN=MSLICEN.ICEMODEL.&SH..SIPMOD.DATA,DISP=SHR
248.  //FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
249.  //FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
250.  //    DISP=(,CATLG,DELETE),UNIT=DISK,
251.  //    SPACE=(TRK,(30,5),RLSE),
252.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
253.  //FT06F001 DD SYSOUT=P
254.  //FT08F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
255.  //FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,DISP=OLD
256.  //FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
257.  //FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AGCRCDF.DATA,DISP=SHR
258.  //FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
259.  //FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
260.  //FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
261.  //FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
262.  //    PEND
263.  //STEP01 EXEC CREATE6,
264.  //    CY=10,PY=00,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
265.  //    DS=EEAMID,SH=LSR
266.  //MSLIC610 JOB (ACCOUNT ID,BIN NO,,200),'STEP10',TIME=(1,30),MSGCLASS=P
267.  /*CPUID EPA3
268.  /*ROUTE PRINT HOLD
269.  /*AFTER   MSLIC609
270.  //FLCN6 PROC
271.  //    EXEC PGM=FLCN6,REGION=1500K
272.  //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
273.  //FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
274.  //FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,DISP=MOD
275.  //FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
276.  //FT06F001 DD SYSOUT=P
277.  //FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
278.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
279.  //    SPACE=(TRK,(5,5),RLSE),
280.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
281.  //FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
282.  //FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
283.  //FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
284.  //FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
285.  //FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
286.  //    DISP=(NEW,CATLG,DELETE),UNIT=DISK,
287.  //    SPACE=(TRK,(250,25),RLSE),
288.  //    DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
289.  //FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..NSPSREGS.DATA,DISP=SHR
290.  //FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..NUMCOL.DATA,
291.  //    DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
292.  //    DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
293.  //        PEND
294.  //B EXEC FLCN6,
295.  //    CY=10,PY=00,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
296.  //    DS=EEAMID,ARO=BASE87,FO=Y
```

TABLE 25. COMPOSITE JCL

```
//MSLIC611 JOB (ACCOUNT ID,BIN NO),'STEP11',TIME=(1,30),MSGCLASS=P
/*CPUID EPA3
/*ROUTE PRINT HOLD
/*AFTER   MSLIC610
//CREATE6 PROC
//   EXEC PGM=CREATE6,REGION=1000K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&SN..SIPMOD.DATA,DISP=SHR
//FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
//   DISP=(,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(30,5),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT06F001 DD SYSOUT=P
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
//FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,DISP=OLD
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AGCRCDF.DATA,DISP=SHR
//FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
//FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..MUNCOL.DATA,DISP=SHR
//FT18F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.85.BTUPOP.DATA,DISP=SHR
//   PEND
//STEP01 EXEC CREATE6,
//   CY=20,PY=10,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
//   DS=EEAMID,SN=LSR
//MSLIC612 JOB (ACCOUNT ID,BIN NO,,200),'STEP12',TIME=(1,30),MSGCLASS=P
/*CPUID EPA3
/*ROUTE PRINT HOLD
/*AFTER   MSLIC611
//FLCH6 PROC
//   EXEC PGM=FLCH6,REGION=1500K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,DISP=MOD
//FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
//FT06F001 DD SYSOUT=P
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
//   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(5,5),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLPPOP.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..MUNCOL.DATA,DISP=SHR
//FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
//   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(250,25),RLSE),
//   DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
//FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..HSPSREGS.DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..MUNCOL.DATA,
//   DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//      PEND
//B EXEC FLCH6,
//   CY=20,PY=10,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
//   DS=EEAMID,ARO=BASE87,FO=Y
```

TABLE 25. COMPOSITE JCL

```
//MSLIC613 JOB (ACCOUNT ID,BIN NO),'STEP13',TIME=(1,30),MSGCLASS=P
/*CPUID EPA3
/*ROUTE PRINT HOLD
/*AFTER   MSLIC612
//CREATE6 PROC
//   EXEC PGM=CREATE6,REGION=1000K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BTUPOP.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&SN..SIPMOD.DATA,DISP=SHR
//FT03F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT04F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTUPOP.DATA,
//   DISP=(,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(30,5),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT06F001 DD SYSOUT=P
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC&PY..BLRAFC4.DATA,DISP=SHR
//FT09F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..BLRPOP.DATA,DISP=OLD
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.SIZCUDIS.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.FIXED.AGCRCDF.DATA,DISP=SHR
//FT12F001 DD DSN=MSLICEN.ICEMODEL.FIXED.NEWSIPS2.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..BTURTC.DATA,DISP=SHR
//FT17F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
//FT18F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.85.BTUPOP.DATA,DISP=SHR
//FT19F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.90.BTUPOP.DATA,DISP=SHR
//FT20F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.95.BTUPOP.DATA,DISP=SHR
//   PEND
//STEP01 EXEC CREATE6,
//   CY=30,PY=20,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
//   DS=EEAMID,SN=LSR
//MSLIC614 JOB (ACCOUNT ID,BIN NO,,200),'STEP14',TIME=(1,30),MSGCLASS=P
/*CPUID EPA3
/*ROUTE PRINT HOLD
/*AFTER   MSLIC613
//FLCN6 PROC
//   EXEC PGM=FLCN6,REGION=1500K
//STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
//FT01F001 DD DSN=MSLICEN.ICEMODEL.&DS..DEMSCEN.DATA,DISP=SHR
//FT02F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,DISP=MOD
//FT05F001 DD DSN=MSLICEN.ICEMODEL.FIXED.FCOPT&FO..DATA,DISP=SHR
//FT06F001 DD SYSOUT=P
//FT08F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BTURTC.DATA,
//   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(5,5),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//FT09F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RYEAR&CY..DATA,DISP=SHR
//FT10F001 DD DSN=MSLICEN.ICEMODEL.FIXED.RETRCOST.DATA,DISP=SHR
//FT11F001 DD DSN=MSLICEN.ICEMODEL.&PCRSC..BLRPOP.DATA,DISP=SHR
//FT13F001 DD DSN=MSLICEN.ICEMODEL.&PFRSC&PY..NUMCOL.DATA,DISP=SHR
//FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..BLRAFC4.DATA,
//   DISP=(NEW,CATLG,DELETE),UNIT=DISK,
//   SPACE=(TRK,(250,25),RLSE),
//   DCB=(DSORG=PS,LRECL=158,BLKSIZE=15800,RECFM=FB)
//FT15F001 DD DSN=MSLICEN.ICEMODEL.&ARO..HSPSREGS.DATA,DISP=SHR
//FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC&CY..NUMCOL.DATA,
//   DISP=(,CATLG,DELETE),UNIT=DISK,SPACE=(TRK,(10,10),RLSE),
//   DCB=(DSORG=PS,LRECL=80,BLKSIZE=8000,RECFM=FB)
//      PEND
//B EXEC FLCN6,
//   CY=30,PY=20,CYSC=LSR,PCRSC=LSR,PFRSC=LSR,
//   DS=EEAMID,ARO=BASE87,FO=Y
```

TABLE 25. COMPOSITE JCL

```
417.    //MSLIC615 JOB (ACCOUNT ID,BIN NO,,200),'STEP15',TIME=(1,30),MSGCLASS=P
418.    /*CPUID EPA3
419.    /*ROUTE PRINT HOLD
420.    /*AFTER   MSLIC614
421.    //TABLE6 PROC
422.    //       EXEC PGM=TABLE6,REGION=1500K
423.    //STEPLIB DD DSN=MSLICEN.ICEMODEL.LOADLIB.OBJ,DISP=SHR
424.    //FT10F001 DD DSN=MSLICEN.ICEMODEL.BASE80.BLRAFC4.DATA,DISP=SHR
425.    //FT11F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.85.BLRAFC4.DATA,DISP=SHR
426.    //FT12F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.90.BLRAFC4.DATA,DISP=SHR
427.    //FT13F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.95.BLRAFC4.DATA,DISP=SHR
428.    //FT14F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.00.BLRAFC4.DATA,DISP=SHR
429.    //FT15F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.10.BLRAFC4.DATA,DISP=SHR
430.    //FT16F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.20.BLRAFC4.DATA,DISP=SHR
431.    //FT17F001 DD DSN=MSLICEN.ICEMODEL.&CYSC.30.BLRAFC4.DATA,DISP=SHR
432.    //FT18F001 DD DSN=MSLICEN.ICEMODEL.&CYSC..ESIN.DATA,DISP=SHR
433.    //FT06F001 DD SYSOUT=P
434.    //       PEND
435.    // EXEC TABLE6,
436.    //  CYSC=LSR
437.    //FT05F001  DD *
438.    2030
439.    BASE CASE
```

TABLE 26. TABLE6 JCL

```
1.  //MSLTABLE JOB (ACCOUNT ID,BIN NO,,200),'TABLE',TIME=(1,30),MSGCLASS=P
2.  /*CPUID EPA3
3.  /*ROUTE PRINT HOLD
4.  //TABLE6 PROC
5.  //       EXEC PGM=TABLE6,REGION=1500K
6.  //STEPLIB DD DSN=MSLICEM.ICEMODEL.LOADLIB.OBJ,DISP=SHR
7.  //FT10F001 DD DSN=MSLICEM.ICEMODEL.BASE80.BLRAFC4.DATA,DISP=SHR
8.  //FT11F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.85.BLRAFC4.DATA,DISP=SHR
9.  //FT12F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.90.BLRAFC4.DATA,DISP=SHR
10. //FT13F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.95.BLRAFC4.DATA,DISP=SHR
11. //FT14F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.00.BLRAFC4.DATA,DISP=SHR
12. //FT15F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.10.BLRAFC4.DATA,DISP=SHR
13. //FT16F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.20.BLRAFC4.DATA,DISP=SHR
14. //FT17F001 DD DSN=MSLICEM.ICEMODEL.&CYSC.30.BLRAFC4.DATA,DISP=SHR
15. //FT18F001 DD DSN=MSLICEM.ICEMODEL.&CYSC..ESIM.DATA,DISP=SHR
16. //FT06F001 DD SYSOUT=P
17. //       PEND
18. // EXEC TABLE6,
19. //  CYSC=LSR
20. //FT05F001  DD *
21. 2030
22. BASE CASE
```

to 40 characters, including blank spaces in front of the title for centering) which will be printed at the top of every output table. Leave line 22 blank if you wish to suppress this option.

The output tables present aggregate ICE Model projections for industrial fossil fuel-fired boilers by year (1980 base year, 1985, 1990, 1995, 2000, 2010, 2020, and 2030), including:

- SO_2 emissions by State
- NO_x emissions by State
- Sulfate emissions by State
- Particulate matter emissions by State
- Total annualized costs by State (the sum of new and retrofit boiler and pollution control equipment annualized capital costs,* annual non-fuel O&M costs, and fuel costs in the output year)
- Fuel demand by fuel type and State for all boilers
- Fuel demand for new industrial boilers by fuel type and State
- National fuel demand for new industrial boilers by size (eight categories), annual capacity utilization rate (five categories), and fuel type
- National number of new industrial boilers by size class (3 aggregate groups), previous coal experience (with or without), and fuel type.

After the TABLE6 program output has been printed, all ICE Model-created files (those with a second qualifier equivalent to the value of CYSC) can be deleted. The exception may be:

- ICEMODEL._ _ _ _ _ _.ESIM.DATA

This file may be retained as an ESIM input file.**

---

*Capital costs x 0.13147, a capital recovery factor based on ten percent interest rate and a 15-year period.

**The dataset naming conventions are described in Appendix A.

APPENDIX A. DATASET NAMING CONVENTIONS

All datasets used by the ICE Model have a four-part name of the following form: "ICEMODEL.2ndqualifier.3rdqualifier.4thqualifier". Each qualifier is no more than eight characters. The first qualifier is always "ICEMODEL". The fourth qualifier is "PGM", "OBJ", "PROC" or "CNTL," or "DATA", depending on whether the dataset contains source code, object code, JCL, or data, respectively. The third qualifier describes the information contained in the dataset (e.g., "BLRPOP" for a boiler population file). Table A-1 describes all of the "third qualifiers" used by the ICE Model.

The second qualifier distinguishes between files where the other three qualifiers are the same (e.g., when there are several versions of a boiler population). The second qualifier is the part of the dataset name which is specified through symbolic parameters in the JCL. There are three forms of this qualifier, corresponding to the three methods for creating an ICE Model dataset -- permanent, user-created, and ICE-created.*

As the name implies, permanent datasets are never modified by the ICE Model or the user. They concern the user only to the extent that they always must be present when running the model. The names of these datasets are specified explicitly in the JCL, rather than through symbolic parameters. Their second qualifier is always "FIXED".

Before running the ICE Model, certain datasets must be created by the user (see Section 2). The user may create several versions of these datasets in order to vary key inputs between different executions of the model. To distinguish between these several versions of the same file, the user must specify a unique code for the second qualifier of their names. This "user-created" form of the second qualifier may be any 1-8 character string.

The final form of the second qualifier is used by the ICE Model to name datasets it creates. The model appends the value of the symbolic parameter CY

---

* As part of its description of all of the third qualifiers used by the ICE Model, Table A-1 categorizes them by these three types of second qualifiers.

TABLE A-1. ICE MODEL DATASET NAMES: THIRD QUALIFIERS

Type	Third Qualifier Name	Dataset Contents
Permanent datasets	AQCRDF	Cumulative distribution function for assigning new boilers to AQCRs
	FCOPTN	Tells new boiler fuel choice program to use least-cost criterion
	FCOPTY	Tells new boiler fuel choice program to use the statistical decision module[a]
	LOADLIB	Partitioned dataset holding all ICE Model load modules
	NEWSIPS2	SIPs
	RETRCOST	Capital costs of retrofitting to a different fuel type
	SIZCUDIS	Distribution of size/capacity utilization rate categories for new industrial boilers
	RYEAR85 RYEAR90 RYEAR95 RYEAR00 RYEAR10 RYEAR20 RYEAR30	The current year, and how many years there are between the previous model year and the current year
User-created datasets	DEMSCEN	Demand scenario data
	NSPSREGS	NSPS regulations
	SIPMOD	SO_2 emissions ceilings for modifying SIPs

[a] Standard operating procedure.

TABLE A-1. ICE MODEL DATASET NAMES: THIRD QUALIFIERS
(Continued)

Type	Third Qualifier Name	Dataset Contents
ICE-created datasets	BLRAFC4	Current year's boiler population after being processed by the fuel choice program
	BLRPOP	Current year's boiler population before being processed by the fuel choice program
	BTUPOP	Current year's boiler population expressed as total Btu by State/industry group and base year/non-base year
	BTURTC	Total Btu by State/industry group which retrofitted to coal during the current year
	ESIM	Current year's ESIM file
	NUMCOL	Cumulative number of industrial plants with previous coal experience

to the value of CYSC to create this form of the second qualifier. The result is a code which specifies the scenario and year in which the data set was created. For example, in a fuel choice run where CYSC=TEST01 and CY=95, the following three datasets are created:

- ICEMODEL.TEST0195.BTURTC.DATA
- ICEMODEL.TEST0195.BLRAFC4.DATA
- ICEMODEL.TEST0195.NUMCOL.DATA

Similarly, at any point in a run, the model uses the values assigned to PCRSC, PFRSC, and PY to identify currently needed ICE-created datasets which were created earlier in the run.